Lucent Technologies
Bell Labs Innovations

SLC®-2000 Access System

Customer Assembly Manual for RT Frames

363-208-010
Issue 5
May 1997

Notice

Every effort was made to ensure that the information in this document was complete and accurate at the time of creation. However, information is subject to change.

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NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residence is likely to cause harmful interference in which case the user will be required to correct the interference at his own expenses.

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SLC®-2000 Access System Customer Assembly Manual for RT Frames

Lucent Technologies 363-208-010 Issue 5 May 1997

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About This Manual

Purpose

This manual provides installation instructions for the *SLC*®-2000 Access System RT Frame for end users responsible for their own equipment assembly, mounting, assembly, and connections of the RT System. It can also be used as a troubleshooting guide for installation wiring problems. Refer to Lucent Technologies 363-208-001 *SLC*-2000 Access System User/Service Manual for any activity involving system turn-up, circuit turn-up, maintenance, or trouble analysis.

Scope

This document is intended to enable installation personnel to install the RT Frame equipment without the use or reference to any documents other than job drawings and specifications. Only the *SLC*-2000 RT Frame Assembly installation instructions are covered herein. Refer to other appropriate Lucent Technologies Practices for installation instructions of RT cabinets.

Intended Audiences

This installation manual is for *SLC*-2000 Access System customers who maintain their own installation organization to install equipment.

This manual is intended ONLY for the installation of the 7-foot RT Frame in remote terminal hut, customer premises, or CEV environments; and for preliminary tests performed prior to turnover tests by remote terminal testing personnel.

Reason for Reissue

This manual covers activities relating to installation of the RT Frame and equipment associated with the SD7C174-01 *SLC*-2000 Remote Terminal Application Schematic drawing. The contents of this manual is based on information from the Application Schematic issue which is included herein:

SD7C174-01 Issue 4 *SLC*-2000 Remote Terminal Application Schematic

This manual has been reissued (Issue 3) to include the equipment shown in issue 4 of the SD7C174-01 *SLC*-2000 Remote Terminal Application Schematic drawing.

This manual has been reissued (Issue 4) to correct typographical errors and to add AT&T Practice 065-215-250 after the Supplementary Information tab.

This manual has been reissued (Issue 5) to correct the information about the DS1 connection of the Metallic Distribution Shelf to DSX-1 panel in Chapter 3. The addition of the ED7C723-35, Groups 17 through 22, Cable Assemblies allows for the cabling between the DSX-1 panels and the MDS and HDOS and the use of MSDT/FiberReach servers throughout the MDS. It is also being reissued to correct typographical errors, to add the new cable assemblies, and to change from an AT&T to a Lucent Technologies manual.

How to Use This Manual

This manual is organized as follows:

- About This Manual
  This chapter defines the purpose, scope, and intended audience for this document, provides introductory and support information on this document, includes the bibliography (references), lists training courses, and tells how to obtain technical support on the system.
- Chapter 1, General Information
  This chapter contains descriptions of the frame structure, channel shelf modularity, and growth patterns. Also included are general circuit pack handling precautions and specific warnings relating to lightwave safety and ESD considerations.
- Chapter 2, Installation Procedures
  This chapter includes instructions for field assembly of frames and shelves including details and precautions for handling, inspection, placement, and mounting the equipment.
- Chapter 3, Cabling, Wiring, and Assembly
  This chapter contains information for installing cable assemblies and related equipment including the inter-shelf (factory preassembled) and external wiring (field fabricated) connections to ancillary equipment.
- Chapter 4, Parts Lists and Kits
  This chapter lists the assemblies, kits, parts, and tools required for the initial installation or subsequent growth. Also included are tools and replacement parts for field repairs.

- Chapter 5, Parts Description
  This chapter describes the requirements and construction of connectors, cables, and assemblies.
- Applications
  This chapter includes interconnect figures for troubleshooting and office record keeping. The application schematic drawings also included.
- Supplementary Information
  This chapter (Practice 065-215-250) includes detailed framework information and floor layout and drilling procedures which may be used as a reference to supplement local practices.

Safety Instructions

Admonishments

This manual may contain admonishments in the form of DANGERS, WARNINGS, and CAUTIONS. These admonishments, listed in order of priority, have the following definitions:

- Danger indicates the presence of a hazard that will cause death or severe personal injury if the hazard is not avoided.
- Warning indicates the presence of a hazard that can cause death or severe personal injury if the hazard is not avoided.
- Caution indicates the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided. Caution is also used for property-damage-only accidents. This includes equipment damage, loss of software, or service interruption.

Related Documents

The following documents provide additional information about the *SLC*-2000 Access System.

- Lucent Technologies 363-208-000 *SLC*®-2000 Access System Applications, Planning and Ordering Guide

  Contents: Benefits and features; applications, configurations; services; product description; cabinet and bay arrangements; operations, administration and maintenance; planning and engineering; product support; technical specifications and ordering.

Information about configurations for COT, RT frame, and cabinet arrangements are provided in the user/service and customer assembly manuals.

- Lucent Technologies 363-208-001 *SLC*®-2000 Access System, User/ Service Manual

  Contents: System overview, product description, user interface, operations and maintenance procedures (including acceptance testing, provisioning, turnup, application support, maintenance, alarming, trouble clearing, inventory, and performance monitoring), and maintenance support information (alarm tables, etc.).

- Lucent Technologies 363-208-003, *SLC*®-2000 Access System, Command and Message Manual

  Contents: User interfaces, system administration (including software upgrades, establishing passwords and logins, and security), entity addressing, user interface procedures, command/message syntax, system command manual pages, and system report manual pages.

- Lucent Technologies 363-208-011, *SLC*®-2000 Access System. Customer Assembly Manual for COT Frames

  Contents: Configuration drawings and detailed instructions for assembling and connecting the equipment in a COT frame arrangement. This document includes installation procedures, cabling and wiring diagrams, the Application SD's, a parts list and supporting information.

The following documents provide information about the DDM-2000 FiberReach Multiplexer.

- Lucent Technologies 363-206-300, DDM-2000 FiberReach Multiplexer. Applications, Planning, and Ordering Guide

  Contents: Features, applications, high-level description, operations, administration, maintenance, and provisioning (OAM&P), system planning, ordering, product support, reliability information, technical specifications, and a synchronous optical network (SONET) overview.

- Lucent Technologies 363-206-301, DDM-2000 FiberReach Multiplexer. User/Service Manual

  Contents: Detailed description, technical specifications, commands and reports, and operations and maintenance procedures.

- Lucent Technologies 363-206-310, DDM-2000 FiberReach Multiplexer. Installation Manual

  Contents: Detailed instructions for assembling and connecting the wideband shelves (WBS) and narrowband shelves (NBS). This document includes installation procedures for the equipment, electrical and optical cabling.

Lucent Technologies Contacts

Topic	Contact Location	Telephone
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General Information

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General Information

1

General Information

Installation Activity and Test Sequence

Installation and test operations for *SLC*®-2000 Remote Terminal (RT) Frames are outlined in this text as sequential procedures. For ease of operation, it is recommended that the format and sequence listed herein be followed. Common mechanical-type instructions and information are outlined in Chapter 2, Installation Procedures.

The installation sequence for a *SLC*-2000 route may begin either at the central office, remote locations, or simultaneously at any combination of offices, depending upon the availability and deployment of personnel. The installation operation is considered complete when all bays are interconnected with the cable or fiber line facilities, and with the power, ringing and alarm systems.

Remote Terminal

Installation consists of the assembly, functional wiring, peripheral cabling, and peripheral powering of the 7-foot *SLC*-2000 RT bays. Also included are the peripheral equipment, such as the ringing supplies and their associated interconnections.

Wiring Operations

Preparation of the cable assemblies (VF, T1 lines, and alarms) involves wiring the customer's cables to the furnished connectors, which mate with the *SLC*-2000 Access System equipment shelf connectors. This cable preparation may be performed independently of other installation activity. If this work is done in advance or simultaneously with the site preparation activity, the overall installation interval may be reduced.

Floor Space Preparation

Installation work can begin before the arrival of the *SLC*-2000 RT Frames. The floors can be predrilled using a template derived from footprint figures in Chapter 2, Installation Procedures. Completion of other advance work before the arrival of the equipment (extensions for the cable rack, aisle lighting, and appliance outlets) would further reduce the installation interval.

Tests

The test procedure in this manual consists of voltage readings and wiring continuity checks only. The turn-up and acceptance tests are covered in the *SLC*-2000 User/Service Manual, Lucent Technologies Practice 363-208-001.

The turn-up tests may be performed when all activities covered in this installation manual are completed.

General Precautions

ESD Consequences

Semiconductor devices and circuit packs, in general, are sensitive to static charges. Most circuit pack integrated circuit (IC) damage can be attributed to a discharge of static electricity.

For a person to feel the discharge of static electricity, a minimum level of 3500 volts must exist. A person walking across a floor can generate electrostatic voltages in excess of 5000 volts. Tests have shown that ICs can be damaged by discharges of less than 100 volts. Since ESDs contain little or no current, there is no employee safety hazard.

In addition to ESD resulting from an ungrounded person touching a circuit pack, static discharges may result from other sources. If a piece of plastic is placed near one end of a circuit pack lying on an insulated table top, it can direct its charge into the circuit pack.

Identifying ESD damage can be difficult because in most cases, physical damage cannot be seen. A circuit pack which has been exposed to an ESD may:

- Not be affected, i.e., work perfectly with normal life expectancy
- Function normally, but with reduced life expectancy
- Function erratically at times
- Stop functioning altogether

Electrostatic Discharge Protection Requirements

To reduce the possibility of ESD damage, assemblies are equipped with grounding jacks to enable personnel to ground themselves using wrist straps while handling circuit packs or working on an assembly. The jacks for connection of wrist straps are located at each assembly and are labeled. When grounding jacks are not provided, an alligator clip adapter enables connection to bay frame ground.

All circuit packs shall be stored and transported in original factory packing materials whenever possible. Storage in frames or approved antistatic packaging is acceptable when factory packaging is unavailable.

Whenever a circuit pack with ICs is removed from, or inserted into, the frame or from its container, an antistatic wrist strap must be used.

The antistatic wrist strap must be inspected once a day for damages or when it is suspected that the wrist strap has been stressed.

Before using the antistatic wrist strap, verify with a volt-ohmmeter that approximately 1 megohm resistance is present between the wrist strap frame connector and the wrist harness.

The clip or plug connector of the wrist strap must be connected to a ground which is common with the circuit pack ground. Use the equipment bay or shelf ESD ground jack.

In an emergency, when a properly functioning wrist strap is not available at the job site, the following “touch-ground” procedure shall be used for handling circuit packs containing electronic components.

- Always touch ground (exposed) metal before handling a circuit pack in any way (i.e., inserting, removing, or storing). This must be done just prior to touching the circuit pack. Moving around will necessitate repeating this procedure. Note that painted surfaces are not good ground points.
- Handle circuit packs only by the faceplate or latch and by the top and bottom outermost edges. Never touch the components, leads, or connector pins.
- Put the circuit pack into an antistatic bag or carton immediately upon removing it from a frame.

A grounded person must never hand an unprotected circuit pack to a person who is ungrounded. A static discharge from the ungrounded person through the circuit pack to the grounded person could cause an ESD induced failure. All persons and equipment at a work location must be at common ground potential to be static-safe.

Do not rub or wipe circuit packs containing ICs to clean them or their gold fingers unless both the individual and the circuit pack are the same ground potential.

Work areas must be kept clear of common plastics, a major source of static electricity. When rubbed or handled, these plastics produce a static charge that will not readily dissipate when grounded. These plastics must not make direct contact with ICs or circuit packs. Common plastic materials in this classification include polystyrene packing containers, clear plastic bags, plastic drinking cups, food wrappers, notebooks, and nonconductive plastic solder suckers. (The plastic insulation on small hand tools does not represent a static hazard.)

Put the circuit pack into an antistatic bag or carton immediately after removing it from a frame. Keep adhesive tape (i.e., transparent or masking) away from the circuit packs.

Never place circuit packs on ungrounded metal shelving or on ungrounded portable carts without insulated surfaces.

Lightwave Safety

An Lucent Technologies lightwave digital transmission system and associated optical test sets use semiconductor laser transmitters. The lasers emit lightwaves, at or near infrared wavelengths, into lightguide cables. This light is at the red end of the visible spectrum.

Although, at present, the transmitter power levels are below those known to cause injury to the eye (for example, from a direct inadvertent exposure to the end of an energized fiber), direct exposure at close distances should be avoided.

CAUTION:
Never view any unterminated optical connector with optical instruments other than indirect image-converting devices such as the FIND-R-SCOPE, since viewing optics tend to collimate the energy from an optical connector and, hence, increase the potential risk for injury. Personnel performing these procedures must be trained in laser safety.*

Product Safety

CAUTION:
Only trained service personnel should perform the procedures in this document. These procedures allow exposure to high electrical energy and/or current that may result in electric shock and/or injury to untrained personnel during servicing, maintenance, and installation of this system.

* Registered trademark of FJW Optical Systems, Inc.

General Safety Admonishments

Important General Safety Instructions

1. Read and understand all instructions.
2. Follow all warnings and instructions marked on the product.
3. Do not place the shelves on an unstable cart, stand, or table. The product may fall causing serious damage to the equipment.
4. Slots and openings in these shelves are provided for ventilation. To protect it from overheating, these openings must not be blocked or covered. This equipment should not be placed in a built-in installation unless proper ventilation is provided.
5. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock. Never spill liquid of any kind on the product.
6. For information on proper mounting instructions consult the appropriate section in this installation manual.

Electrical Wiring Admonishments

Important Installation Safety Instructions

1. Read and understand all instructions and warning labels.
2. Installation and maintenance procedures must be followed and performed by trained personnel only. Do not allow non-service personnel to access electrical wiring.
3. All VF, DS1, STS-1E, and DS3 interfaces should not leave the building premises unless connected to telecommunication devices providing primary or secondary protection, as applicable.
4. Never install telecommunication wiring during a lightning storm.
5. Never install telecommunication connections in wet locations.
6. Never touch uninsulated telecommunication wires or terminals unless the telecommunication line has been disconnected at the VF, DS1, STS-1E, or DS3 interface.

7. Never touch uninsulated wiring or terminals carrying direct current or ringing current or leave this wiring exposed. Protect and tape those wires and terminals to avoid risk of fire, electrical shock, and injury to service personnel.
8. Use caution when installing or modifying telecommunication lines.
9. This product should be operated only from the type of power source indicated on the marking label. For information on proper electrical distribution and power requirements, refer to the Application Schematic drawing contained in the APPLICATIONS chapter of this manual.
10. To reduce the risk of electrical shock, do not disassemble this product. Service should be performed by trained personnel only. Opening or removing covers and/or circuit packs may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electrical shock when the unit is subsequently used.
11. Use only Lucent Technologies manufactured UL* recognized circuit packs in this system.

* Registered trademark of Underwriters Laboratory, Inc.

Installation Procedures

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Handling and Uncrating

Handling Considerations

NOTE:
The shipping container is designed to lay lengthwise on the floor. Do not transport or store the containers in a standing position.

NOTE:
When transporting crates or holding in warehouse, do not stack more than two bays high.

NOTE:
When removing containers from the shipping van, place them on a dolly truck in their horizontal shipping positions. Verify that the containers have not been damaged. It is important that all containers be handled with care and precautions be taken not to drop the units.

Uncrating Procedure

Step 1: Uncrate all material in quarters separate from the equipment room in order to keep to an absolute minimum dust, lint, and other undesirable particles which could create maintenance problems.

Step 2: All bays are shipped in a dust-protective antistatic plastic bag and placed in a wooden container. The bay is laid in the container with the front or equipment side up and is so marked. Uncrating should be done in its shipping position.

Step 3: The tools required for uncrating bays are standard pinch bar and claw-type hammer. Care should be exercised when uncrating bays so that damage to equipment does not occur. Only use the pinch bar and/or hammer in areas that have been nailed. Remove top cover first so that an inspection of the contents of the shipping container can be made. Remove side and end plates. The bottom plate that the bay is resting on may remain until the bay is brought to the bay location for mounting. Remove the plastic bay and all foreign material.

CAUTION:
Some bays may be equipped with side covers running from top to bottom. Do not use these covers as a handling point when lifting or moving the bay into position. Use the bay's framework for this purpose.

Inspection

Inspection and Physical Verification

If bay frames are equipped with shelves perform the following steps:

Step 1: Verify that no plug-in units are installed.

Step 2: Verify that no loose parts are at the bottom of the bay.

Step 3: Verify that no damage is visible and that each shelf, if factory equipped, is tightly secured to the bay.

Step 4: Verify that all cables are free of broken, bent, or misaligned connectors.

Step 5: Verify that all factory wiring is secure and tied into forms.

Step 6: Verify that all material is accounted for. Refer to the job specification and PARTS LISTS chapter.

Erecting and Placement

Floor Layout

Bay Footprint

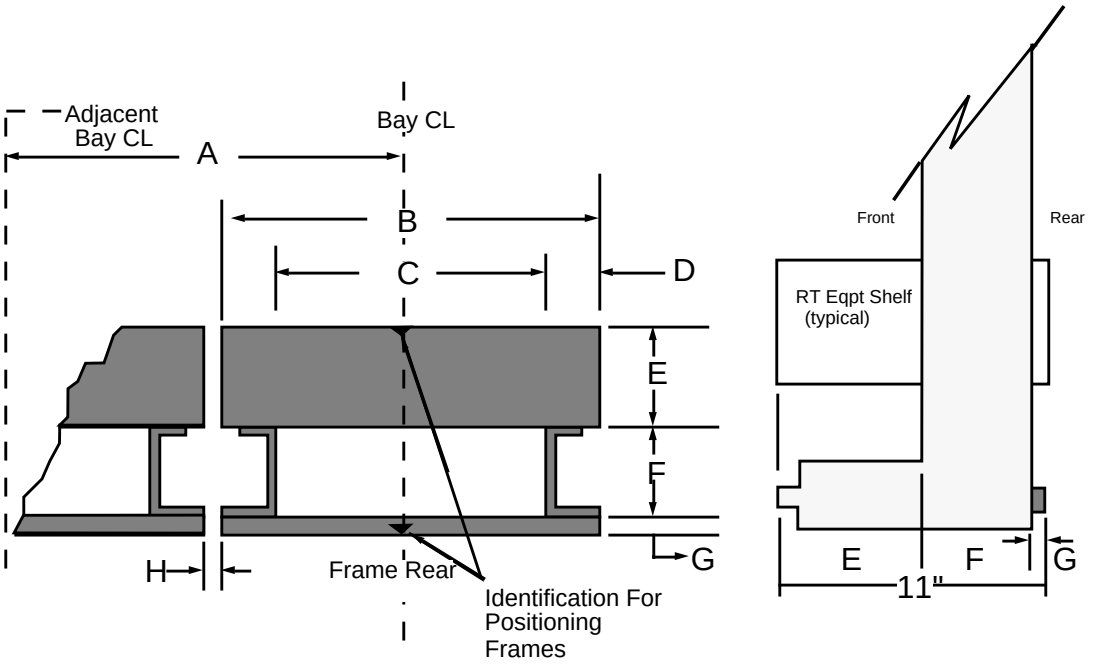
Step 1: Mark the frame name and number on the floor in the space where the frame is to be located. This will help later in locating frame positions when the bays arrive. Cover the markings with a clear shellac if a period of time is expected before the arrival of the bays so that markings do not rub off the floor.

Step 2: Refer to Figure 2-1 for bay framework dimensions.

NOTE:
Refer to the SUPPLEMENTARY INFORMATION section for alternative framework information

Step 3: Refer to Figure 2-1 for floor marking. Mark the floor 26 inches wide for each bay, and use the center of each bay as the reference line. This means that the 25.875 inch wide bay is placed into the 26 inch wide space allowed for each bay.

NOTE:
The network bay frameworks have a center line marking on the front and rear base of the framework which should be lined up with the center line marked on the floor when the bays are positioned.



Top View Side View

Dimensions		
	English (in.)	Metric (mm)
A	26.00	660.40
B	25.875	657.225
C	21.5	546.10
D	2.1875	55.5625
E	5.00	127.00
F	5.00	127.00
G*	1.00	25.4
H	0.125	3.175

* The rear guard rail is not provided with the ED8C500-50 Group 5 frame.

Figure 2-1. Bay Frame Views

Bay Frame Mounting

Step 1: Move the bay to its proper floor location. Exercise care when moving the bay, avoiding sudden shock or strain to equipment shelves, if equipped. Do not handle or support the frame by the side covers.

Step 2: The bay can be erected into position by using two or more people. For added safety, located at the very top of the bay are three 5/8- by 11 inch holes. These holes are for lifting. When required, assemble the 5/8- by 11 inch eye bolt into these holes, and tie off with rope temporarily to some solid structure overhead (refer to Figure 2-3).

Step 3: Lift the bay and place into the proper location in the lineup. Visually inspect for obvious damage.

Step 4: Before the bay is secured to the floor, verify that it is level so that alignment of adjacent bays via junction plates can be achieved.

Step 5: Use the job specification information for positioning the bay frame to its assigned lineup location.

Step 6: Use Figure 2-2 as a drilling template which specifies the hole locations in the framework base. Use location 1 first; then location 2 if an obstruction in the concrete is hit; then 3 and 4, if necessary. The number of drillings is dependent upon the earthquake zones and local building practices.

Step 7: Follow local practices for securing the frame to the floor otherwise refer to the detailed information pertaining to floor layout and placement methods in the SUPPLEMENTARY INFORMATION chapter of this manual.

Step 8: Secure the frame to the overhead superstructure using the furnished hardware specified in Figure 2-3.

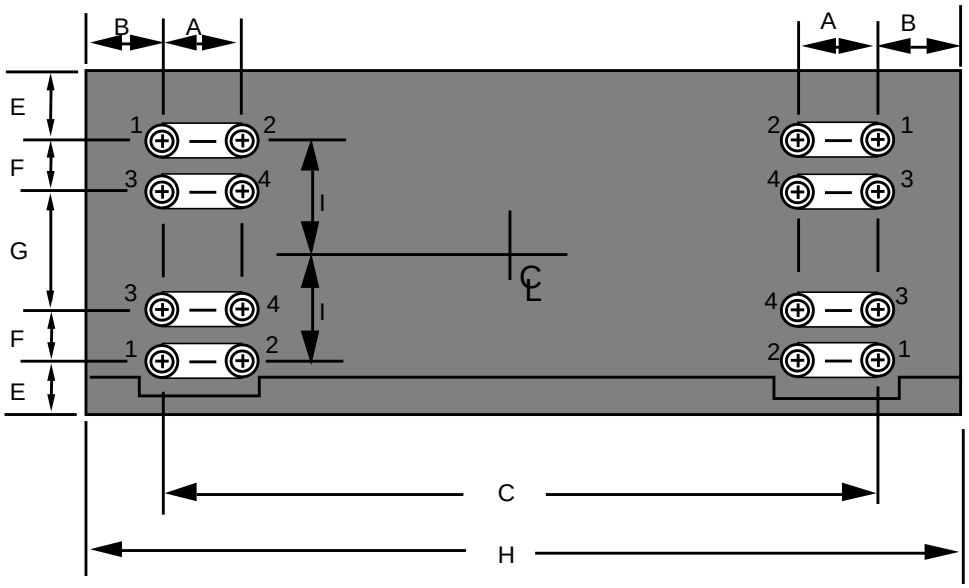
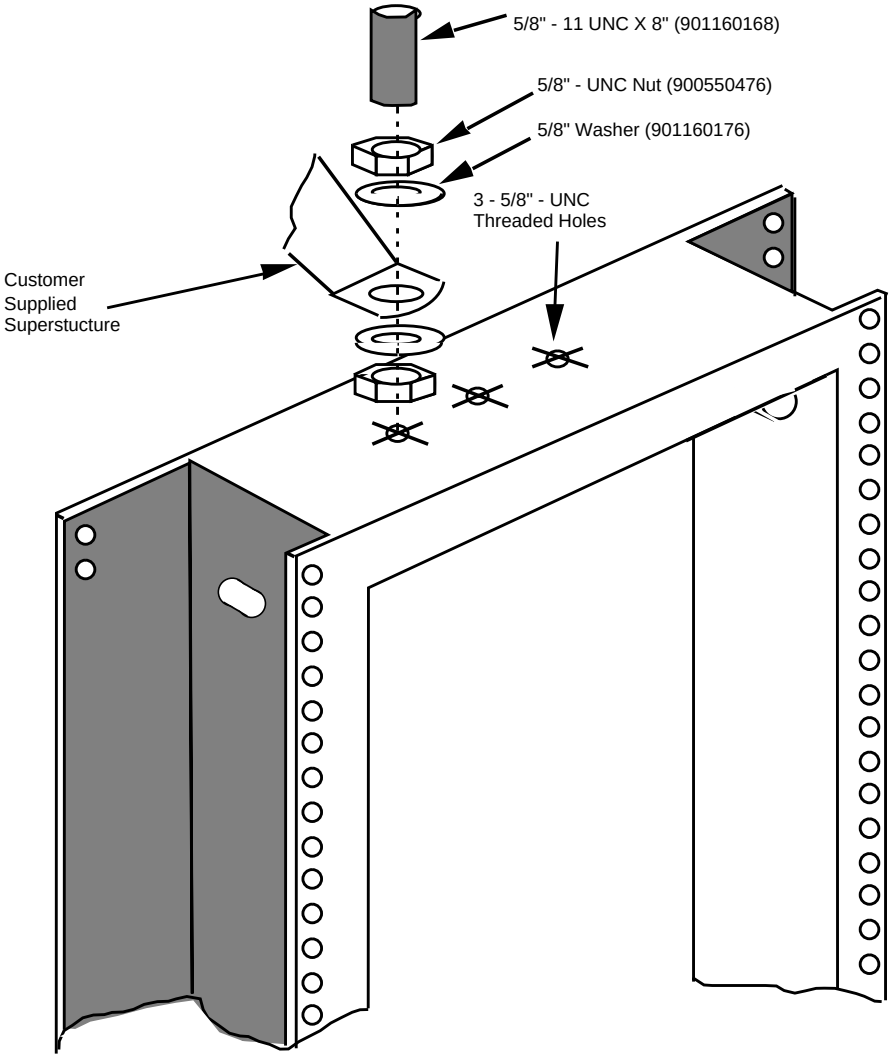


Figure 2-2. Floor Drilling

Table 2-1. Dimensions for Figure 2-2

Symbol	English (in.)	Metric (mm.)
A	2.00	50.800
B	3.94	100.076
C	18.00	457.200
D	7.25	184.150
E	1.17	29.718
F	2.00	50.800
G	3.25	82.550
H	25.87	657.098
I	3.63	92.075



Typical Top of the Bay Superstructure

Figure 2-3. Top of Bay Superstructure

Grounding Connections

Grounding - General

NOTE:
The frame ground (ground ring) connection provided for each framework serves two purposes:

a. A direct earth ground connection for lightning protection.

b. A common ground potential for electrostatic discharge (ESD) protection.

Therefore, it should be the first common wiring connection established once the bay frame has been bolted in place.

NOTE:
All ground connections to the frame shall be made in such a manner as to ensure a low-resistance contact with the metal framework. Remove any paint if necessary. Note that the bay frame has a ground wire attached which can be removed and repositioned or replaced to conform with local grounding codes. Whenever this ground strap is repositioned the frame's paint must be removed as much as necessary to ensure a low-resistance ground and apply an oxidation preventative such as NO-OX-ID* “A”.

Connections

Step 1: All individual frames are provided with grounding wires. It will be necessary to terminate or crimp this bay ground wire to the ground wire (or ground ring) in the cable rack as shown in Figure 2-4.

NOTE:
In locations where a building ground wire is not apparent, the bay ground wire should be extended to the MDF framework near the cable entrance. In all cases conform to local grounding practices.

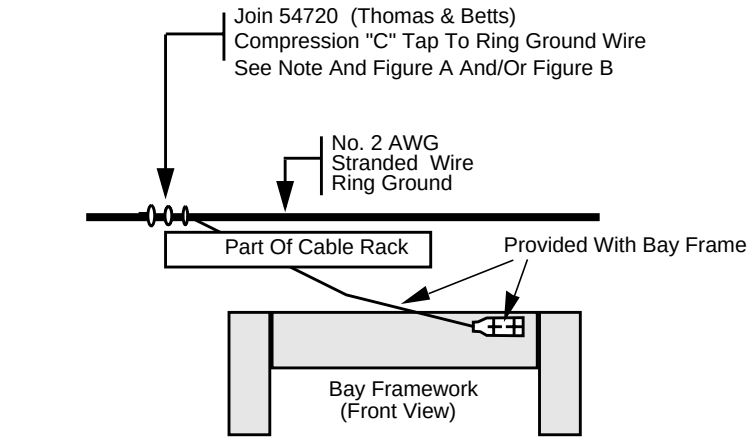
Step 2: In stations where there is more than one frame in a lineup, each frame shall be connected to the ground wire.

* Registered trademark of Sanchem, Inc.

Step 3: Each equipment shelf is equipped with an ESD ground wire which must be bonded to the bay framework. Refer to the section Mounting System Shelves for details.

Step 4: The ARM shelf has also one ESD ground wire which must be bonded to the bay framework. Refer to the section Mounting System Shelves for details.

Step 5: The 4G Fan shelf does not have an ESD ground wire but the shelf must be electrically bonded to the bay framework through its mounting brackets. Refer to the section Mounting System Shelves for details.



Note: The "C" Type Tap Shall Always Turn In The Direction Of The Closest Ring Bus Bond.

Figure A
Crimp Connector Assembly For
No. 2 Or No. 6 AWG
Stranded To Stranded Wire

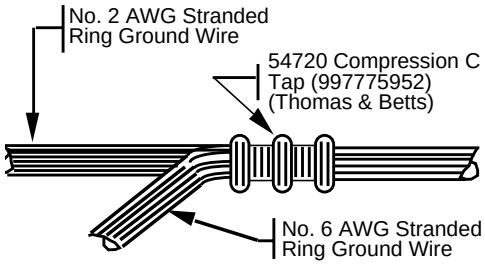


Figure B
Crimp Connector For Assembly For
No. 2 Or No. 6 AWG
Stranded To Solid Copper Wire

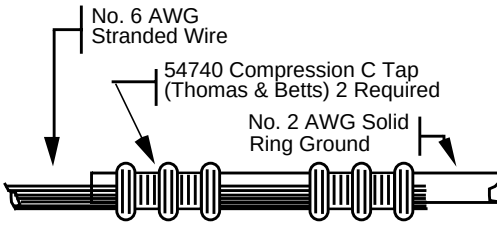


Figure 2-4. Grounding Connections

Mounting System Shelves

NOTE:
These procedures shall be followed when separate shelves must be mounted, when increasing system capacity, or when equipment shelves must be replaced. Refer to the Figure 2-5 or 2-7 for equipment shelf locations.

NOTE:
RT Frames may have been pre-assembled at an Lucent Technologies Service Center with a complement of shelves in accordance with an engineered order or may have only a minimum complement of shelves equipped. In either case the customer's order should be checked for the correct configuration of shelves. RT frames coded J1C265A-1 may have been ordered from the supplier as a complete complement of shelves, factory mounted and interconnected.

NOTE:
Shelves must be assembled only in accordance with the Mounting Hole Locations in Figure 2-5 or 2-7. To mount the shelves otherwise would destroy the integrity of the system airflow, the local cable connections and the growth pattern.

NOTE:
Before attaching the shelf's ground wire to the bay frame, remove as much of the frame's paint as necessary to ensure a low-resistance ground and apply an oxidation preventative such as NO OX-ID "A".

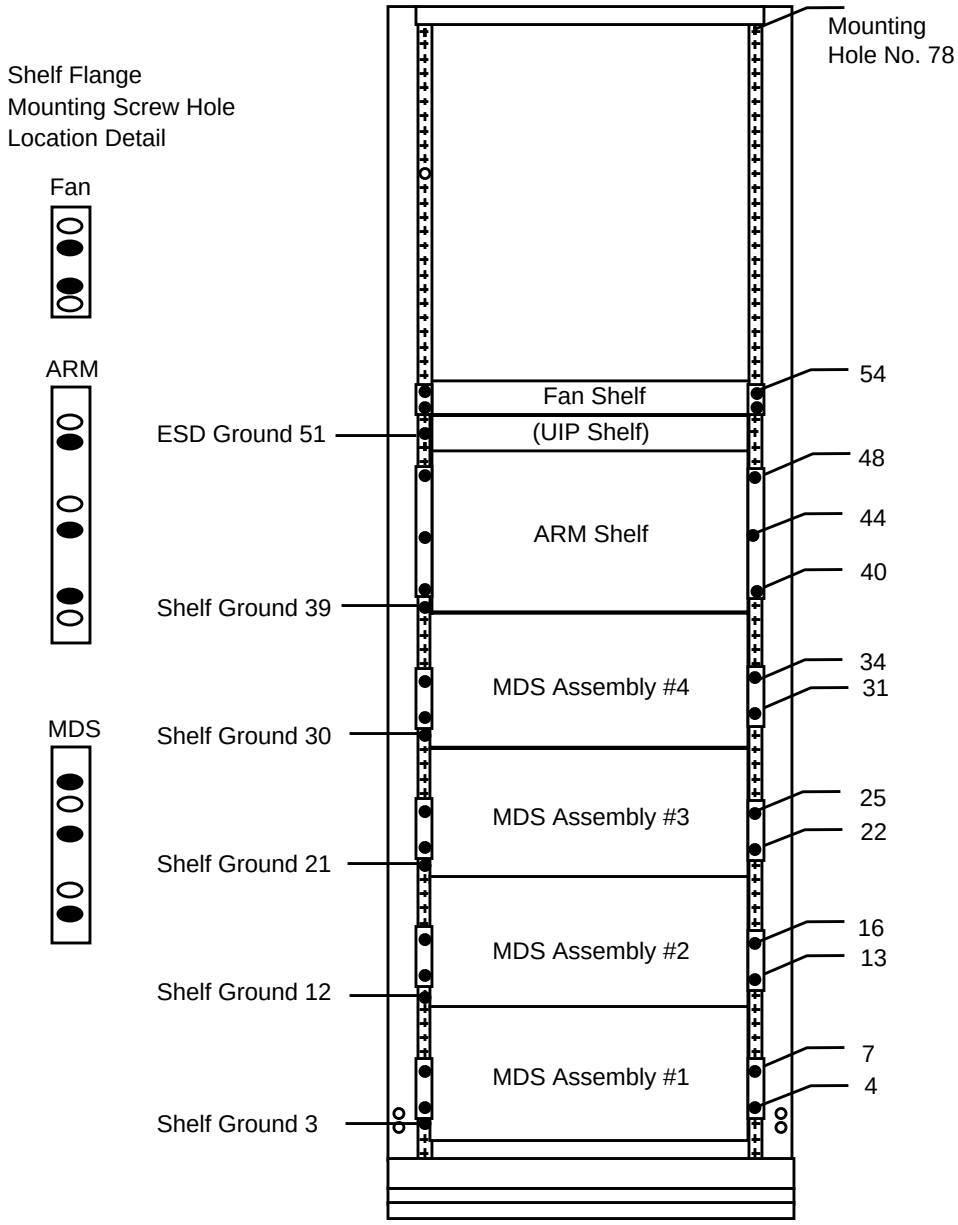


Figure 2-5. 7 Foot RT Bay Metallic Equipment Mounting Locations

MDS Assembly Installation

NOTE:
The maximum number of MDS assemblies which can be installed in the RT Bay is four. The first shelf must be located at the bottom of the bay even if it is the only shelf provided.

NOTE:
The growth pattern for the MDS shelves is from the bottom up. Do not leave any vacant spaces between or below the shelves. Only the first MDS assembly will have a small space below its bay position.

J1C265AB-1 MDS Assembly Mounting Procedure

Step 1: Open the carton and inspect the shelf and all its connectors and cable assemblies for damage or misalignment.

Step 2: Mount the assembly using its attached hardware to its designated bay position. Use the alignment pins to position the assembly.

Step 3: Locate the ground strap attached to each assembly and connect it to the bay frame as indicated in the Figure 2-5.

NOTE:
Remove any paint as necessary on the bay frame to ensure a low-resistance contact.

Step 4: Move the attached shelf cable assemblies forward so that they drape into the bay frame's cable duct areas. Leave the connectors in place at this time for future connection to the Intrabay and Customer Interface cable assemblies.

NOTE:
The following connectors on the shelf dangler cables should be visible in their respective ducts:

Left Duct	Right Duct
P301	J302
P101	P500
P102	P201

Left Duct	Right Duct
P103	P202
P104	P203
	P204

ARM Shelf Installation

NOTE:
Only one ARM shelf can be installed in the RT Bay. The shelf must be located at the specific location depicted in the figure even if only one MDS shelf is provided.

For ease of assembly the Power Interface Unit (PIU) should be mounted on the ARM shelf before the shelf is mounted to its bay position.

404A User Interface Panel (UIP)

NOTE:
This unit is considered a plug-in and shall be installed in accordance with the instructions detailed in the User Service Manual (Lucent Technologies 363-208-001, DLP-518).

ED7C734-30 PIU Mounting Procedure

Step 1: Open the cartons to the ARM shelf and the PIU and inspect the contents especially the connectors and cable assemblies for damage or misalignment.

Step 2: Refer to Figure 2-6 and mount the PIU to the ARM shelf as follows:

a. Using the three screws provided, fasten the PIU hinge to the right side of the ARM shelf from the inside of the shelf.

b. Temporarily close the hinged door by finger-tightening the attached knurled screw head into the ARM shelf.

c. Verify that the attached cables drape downward and are not entangled.

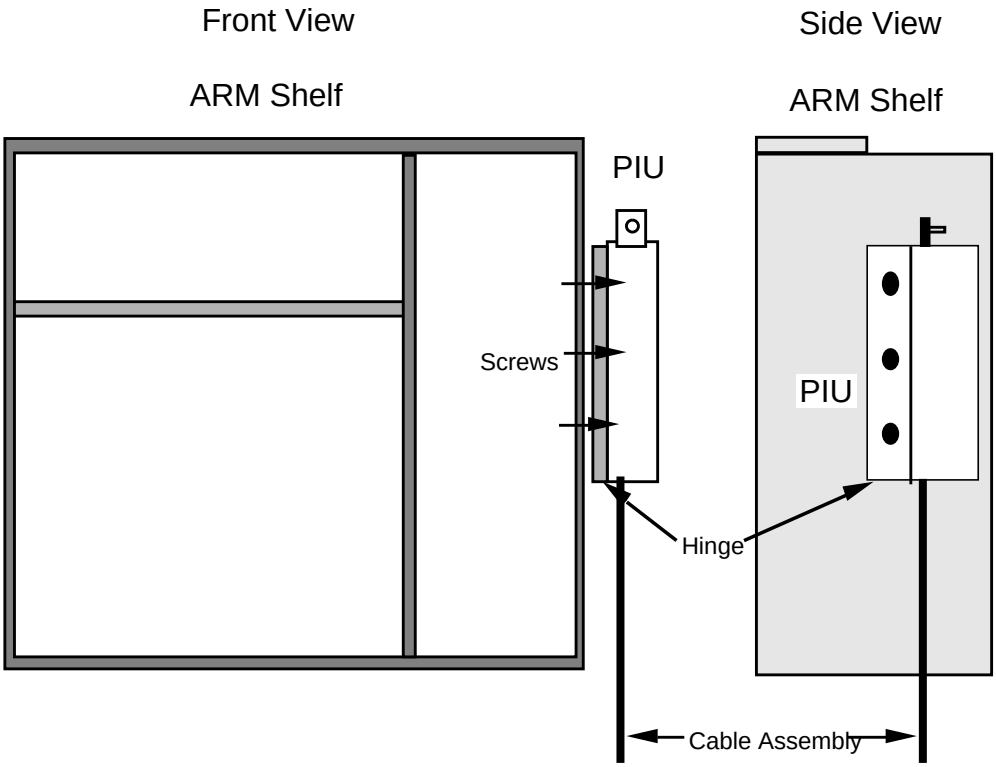


Figure 2-6. PIU Mounting Details

ED7C723-31 DS1 Feeder/Distribution Cable Kit Mounting Procedure

If optional DS1 Cable Assemblies [ED7C723-30 Groups 13()*-16()] have been ordered they should be connected to their respective backplane connectors at this time.

NOTE:
Refer to the instructions contained in the ED7C723-31 Group 2() Kit or refer to the Cabling, Wiring, and Assembly chapter of this manual for details of this operation.

J1C265AA-1 ARM Shelf Mounting Procedure

Step 1: Mount the shelf using its attached hardware to its designated bay position.

Step 2: Locate the ground strap attached to the ARM shelf and connect it to the bay frame as indicated in Figure 2-5.

NOTE:
Remove any paint as necessary on the bay frame to ensure a low-resistance contact.

Step 3: Move the attached shelf cable assemblies forward so that they drape into the bay frame's cable duct areas. Leave the connectors in place at this time for future connection to the Intra-bay and Customer Interface cable assemblies.

NOTE:
The following connectors on the shelf dangler cables should be visible in their respective ducts:

Left Duct	Right Duct
P171	P302-1
P275	P302-2
	P302-3
	P302-4
	P303
	P304

* The parenthesis after the group number of the cable assembly means that there may be an alpha character after the numeric character, e.g., Group 2 or Group 2A or Group 2B.

Left Duct	Right Duct
	J114
	J303
	J500-1
	J500-2
	J500-3
	J500-4

If DS1 Distribution cables have been provided their connectors should be draped into the cable duct as follows:

Left Duct
J165
J166
J167
J168

4G Fan Shelf Installation

NOTE:
Only one 4G Fan Shelf is required for the RT Bay configured for metallic distribution only. The shelf must be located at the specific location depicted in Figure 2-5. A second 4G Fan Shelf is required when the bay is to be equipped with HDOS shelves when configured as a host terminal for areas served via the FITL. This Fan Shelf shall be located above the HDOS shelves as depicted in Figure 2-7.

Mounting Procedure

Step 1: Open the carton and inspect the shelf and all its connectors and cable assemblies for damage or misalignment.

Step 2: The ESD ground path is through the shelf mounting bracket. Remove the protective covering on the back side of the Fan shelf mounting bracket.

Step 3: Mount the shelf using its attached hardware to its designated bay position.

NOTE:
Remove any paint as necessary on the bay frame to ensure a low-resistance contact.

Step 4: Move the attached shelf cable assembly under the shelf so that it drapes into the bay frame's right cable duct area. Leave the P114 connector in place at this time for future connection to the Intrabay and Customer Interface cable assemblies.

HDOS Installation

NOTE:
A High-Density Optics Shelf (HDOS) is required when the RT is configured as a Host Digital Terminal (HDT) supporting the Multi-Services Distant Terminal (MSDT). A fiber facility interconnects the HDOS and the MSDT.

Up to two HDOS equipment shelves can be mounted above the ARM shelf and its 4G Fan Shelf in accordance with the layout of Figure 2-7. If only one HDOS is required, the additional 4G Fan must be located directly above the HDOS #1 assembly. Do not leave any space between the Fan and the HDOS.

J1C265AC-1 Mounting Procedure

Step 1: Open the carton and inspect the shelf and all its connectors and cable assemblies for damage or misalignment.

Step 2: Refer to Figure 2-7 and mount the shelf using its attached hardware to its designated bay position.

Step 3: Locate the ground strap in the right side wiring harness of the HDOS and connect it to the bay frame as indicated in Figure 2-7.

NOTE:
Remove any paint as necessary on the bay frame to ensure a low-resistance contact.

Step 4: Move the attached shelf cable assembles forward so that they drape into the frame's cable duct areas. Leave the connectors in place at this time for future connection to the intra-bay and Customer Interface cable assemblies.

NOTE:
The following connectors on the shelf dangler cables should be visible in their respective ducts:

Left Duct	Right Duct
J191-1	J192-1
J191-2	J192-2
J193	P190

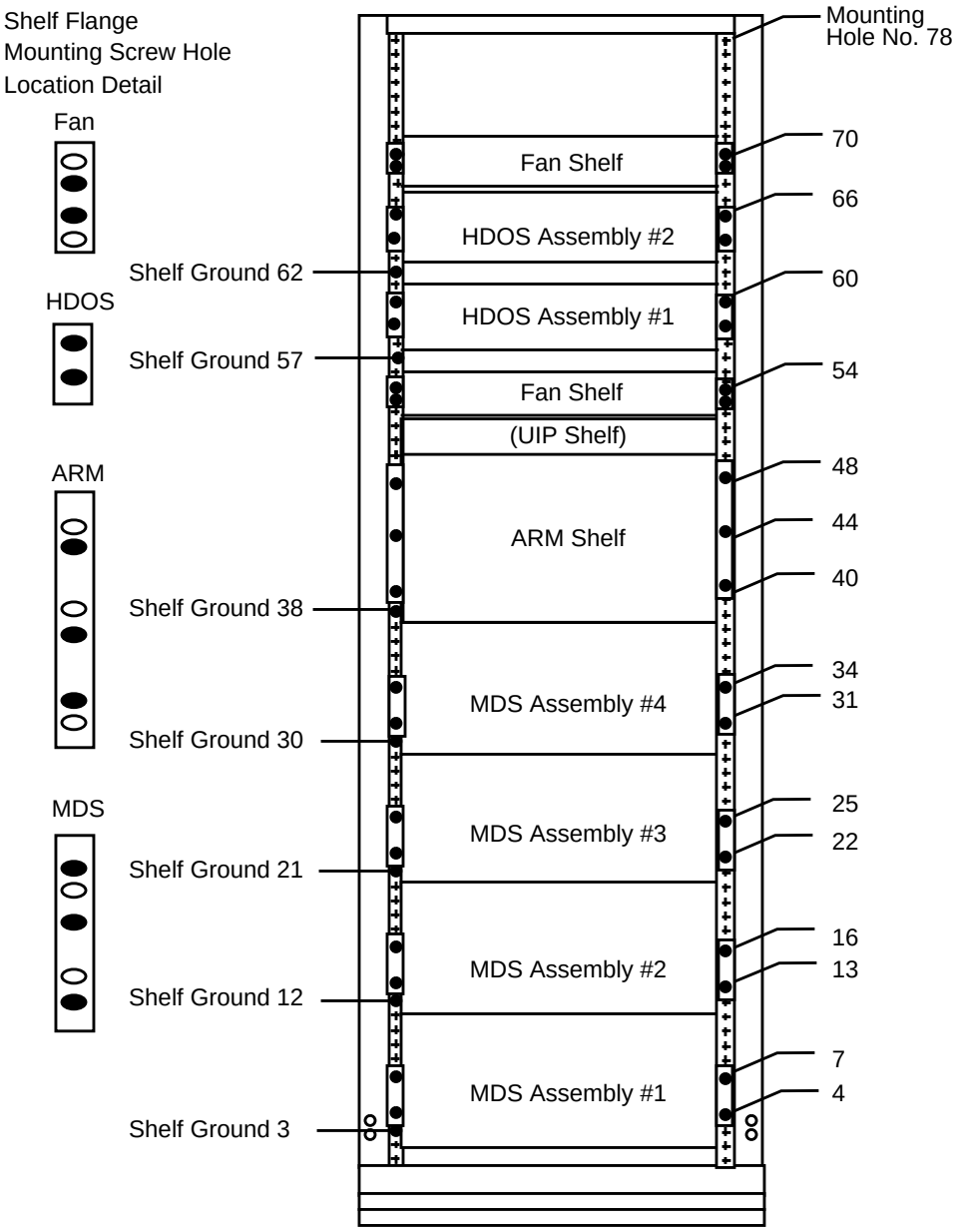


Figure 2-7. 7 Foot RT Bay FITL Equipment Mounting

Ancillary Equipment

The ordering and placement of the following *4TEL RMU** and Reliance OEM items shall be done in accordance with the instructions within the manuals for the subject equipment. The figures referenced herein convey only suggested locations within the *SLC*-2000 bays; and may be restricted because of cable length limitations.

NOTE:
The use of either the *4TEL RMU*, LTF, and Reliance INTS or combinations thereof requires an auxiliary power source outside of the *SLC*-2000 equipment such as the Reliance Fuse Alarm Panel.

Line Test Fanout (LTF)

If a LTF is required (multiple *SLC*-2000 systems within one RT), and the *RMU* is provided, it shall be installed as indicated in Figure 2-8.

NOTE:
The left and right mounting brackets are not part of the LTF and must be provided separately.

If a LTF is associated with the Reliance INTS only, then it must be mounted on its own mounting shelf.

4TEL RMU

Mount the *RMU* or *RMU*/LTF with the required auxiliary fuse panel within 6 inches of each other at the top of the equipment bay suggested by Figure 2-9.

Reliance INTS

Mount the Reliance INTS with the required auxiliary fuse panel within 6 inches of each other at the top of the equipment bay suggested by Figure 2-10.

* 4TEL and RMU are registered trademarks of Teradyne, Inc.

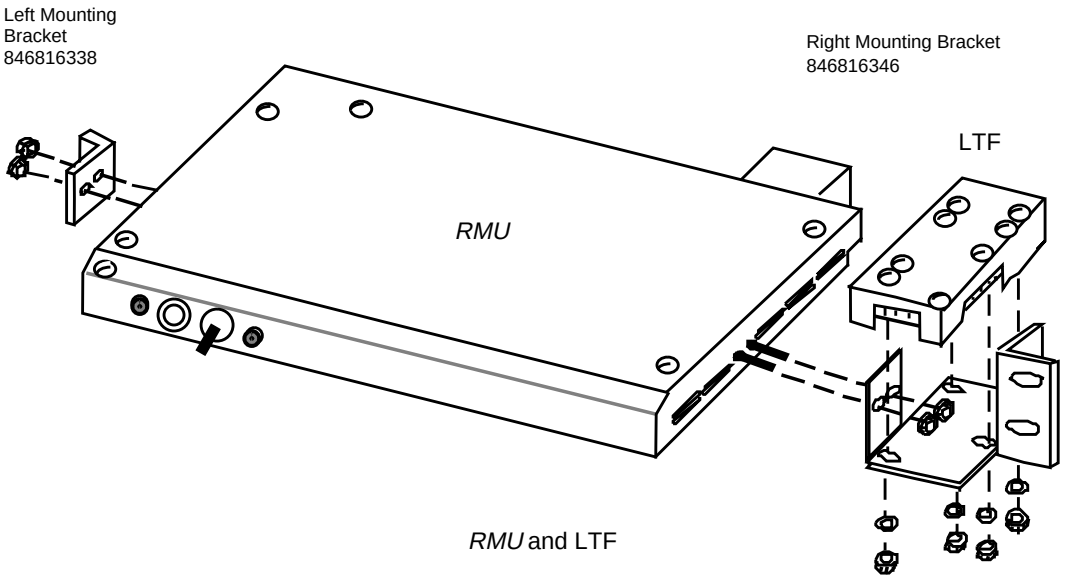


Figure 2-8. 4TEL RMU with LTF Mounting Arrangement

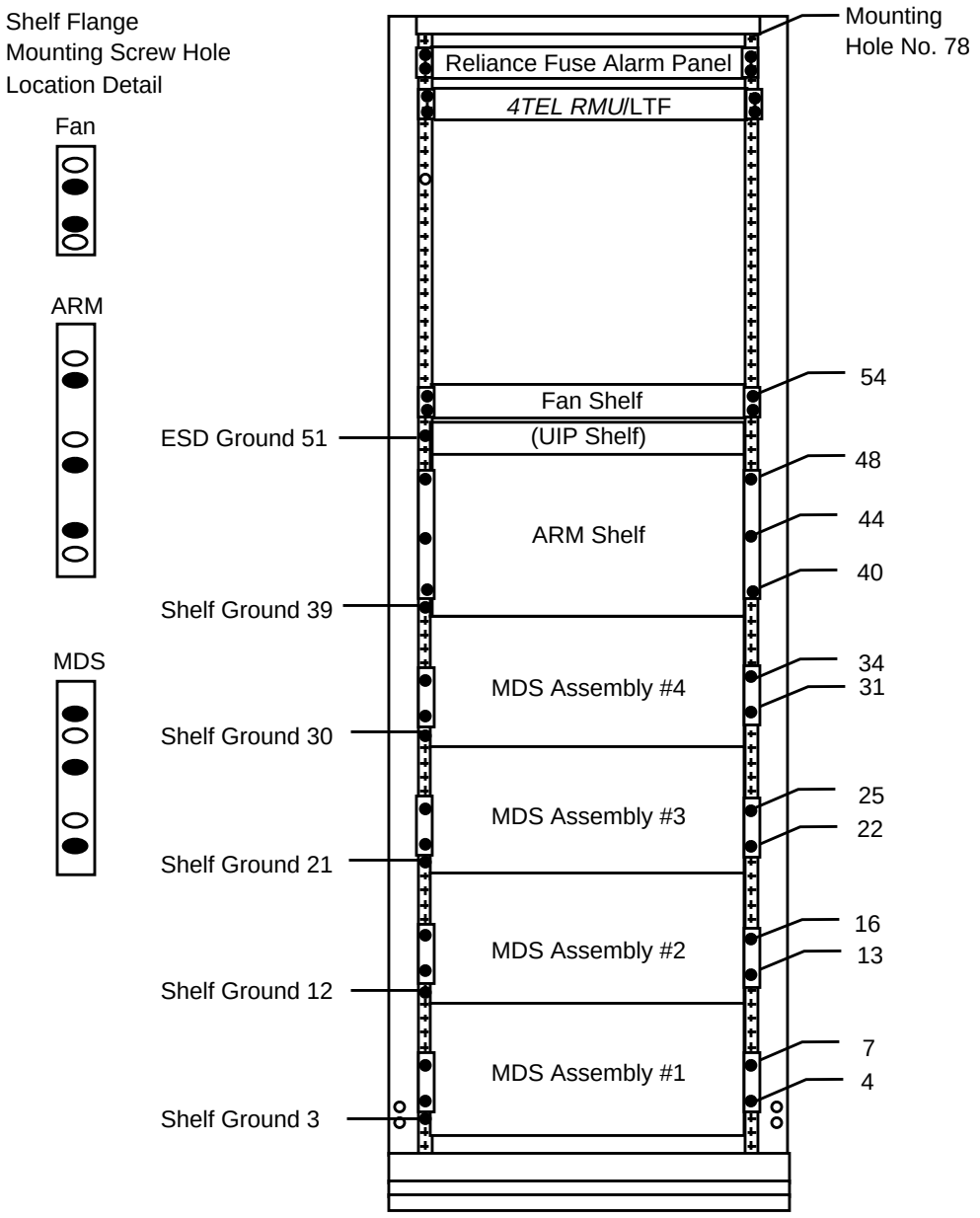


Figure 2-9. Auxiliary Fuse Panel and *4TEL RMU* Mounting Positions

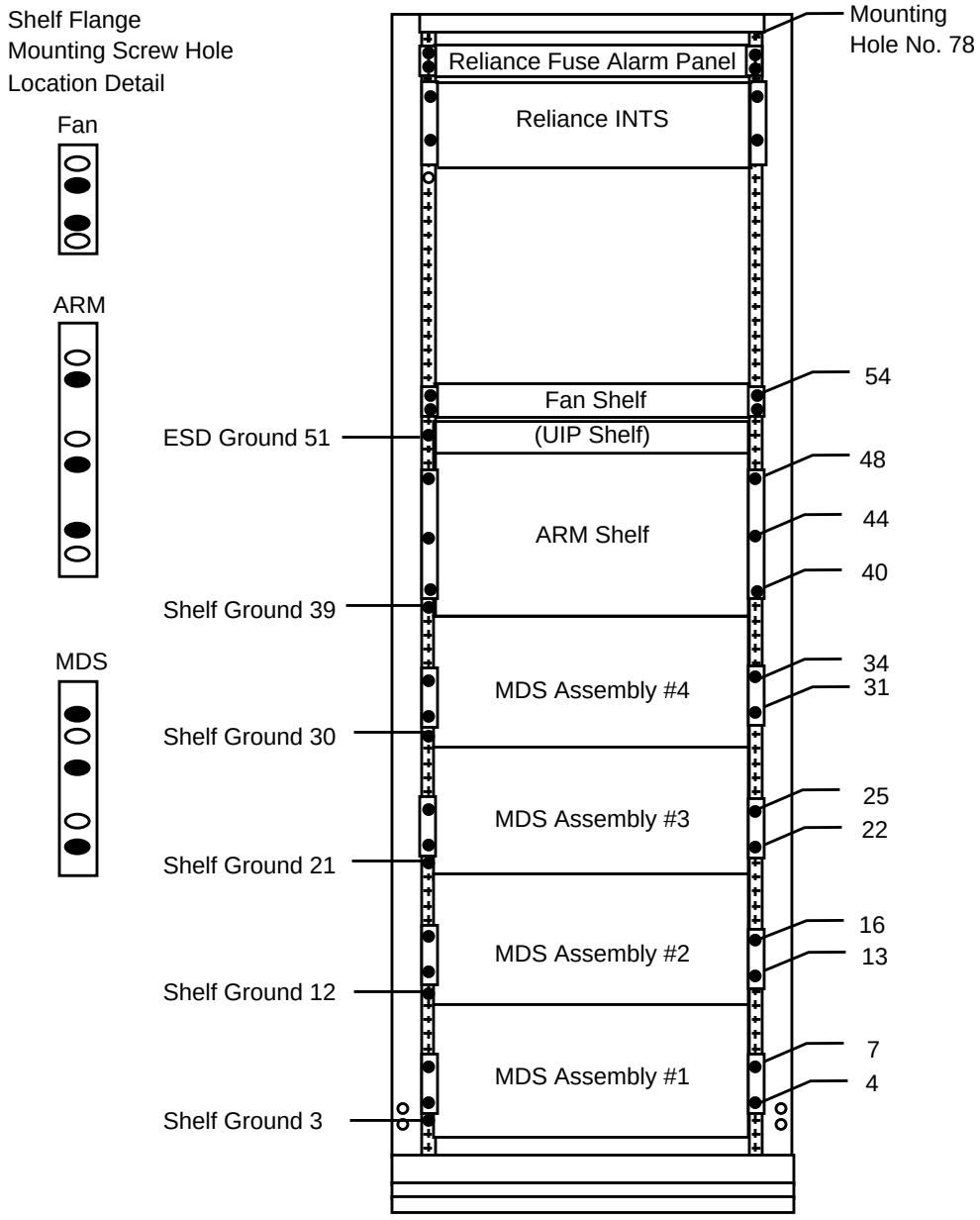


Figure 2-10. Auxiliary Fuse Panel and Reliance INTS Mounting Positions

Cabling, Wiring, and Assembly

3

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Cabling, Wiring, and Assembly

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Cable Assembly Descriptions

Cable Description

Factory Assemblies

Two types of cabling operations are required for connecting factory assemblies. The first is the connecting of Shelf Dangler Cables to other shelf dangler cables. The second is the placement and connecting of intershelf cable assemblies that are common to each shelf (i.e. power, ringing and test functions). These Standard Bay Cable Assemblies are preconnectorized at the factory, and installation consists of putting the right connectors together when mounting new shelves or if cables had been disconnected for packing purposes. Factory assemblies utilize connectors of the Insulation Displacement Connection (IDC) type with low-profile hood assemblies.

Customer Interface Cable Assemblies

These assemblies consist of external cables that interconnect the *SLC*®-2000 RT Bay to various other systems and ancillary equipment such as the following:

a. VF customer lines for cross connections at a FDI block.

b. DS1 line connections for cross connections at the DSX.

c. Optical fiber jumpers for cross connections at the LGX for lightwave systems.

d. Alarm connections for RT inputs.

e. DC Test Pair connections for subscriber testing facilities.

f. Discrete alarm connections for environment status and controls.

g. Power connections from the -48 volt battery plant.

h. Ringing connections from the customer's positive and/or negative ringing supplies.

These external cables must be engineered and fabricated for the complete installation of the *SLC*-2000 RT Frame.

NOTE:
All cables are not required for each installation. Refer to the regional equipment engineering job specifications for a particular office application.

Some job specifications may order factory-assembled cables equipped with the required connectors eliminating the need for installation fabrication at the job site. Refer to the PARTS LISTS section to identify these assemblies by their connector designations (J101, P205, etc.). These assemblies are installed by connecting their connectors to their associated shelf mates. When these cables are not provided in the job order, the installer must fabricate the customer's cables to the appropriate connector according to the instructions provided in this and the PARTS LISTS chapters.

Factory Cable Assembly Wire Color Coding Sequence

Standard wire color coding for the factory assembled cables is shown in the following table. This coding sequence is followed on VF, DS1 and other cables used as danglers and as Customer Interface connections. Use of the color coding will facilitate both terminating operations at the customer's cross-connecting points and troubleshooting routines.

Conductor Pair No.	Identification Colors (Tip/Ring)
1	white-blue/blue-white
2	white-orange/orange-white
3	white-green/green-white
4	white-brown/brown-white
5	white-slate/slate-white
6	red-blue/blue-red
7	red-orange/orange-red
8	red-green/green-red
9	red-brown/brown-red
10	red-slate/slate-red
11	black-blue/blue-black
12	black-orange/orange-black
13	black-green/green-black
14	black-brown/brown-black

Conductor Pair No.	Identification Colors (Tip/Ring)
15	black-slate/slate-black
16	yellow-blue/blue-yellow
17	yellow-orange/orange-yellow
18	yellow-green/green-yellow
19	yellow-brown/brown-yellow
20	yellow-slate/slate-yellow
21	violet-blue/blue-violet
22	violet-orange/orange-violet
23	violet-green/green-violet
24	violet-brown/brown-violet
25	violet-slate/slate-violet

Connector Description

The connectors employed in the system are generally of the following types:

a. Cinch 50 pin connectors used for transmission, alarms, and miscellaneous system interface connections.

b. AMP 6 and 15 pin connectors used for dc power connectors.

c. D Subminiature: DB9, DB25, DB37 pin arrangements used for digital signal transmission and telemetry interconnections.

Cinch Connectors

Cinch connectors as furnished on factory equipment (shelves and intershelf cable assemblies) are the insulation displacement (ID) type. The connectors furnished for use by installers are also ID type requiring the use of special tools for wire insertion or replacement.

Each plug/jack connector combination has an associated covering (hood) which must be installed over the connector to complete the assembly.

Each plug and jack connector has terminal numbers embossed on the pin and wiring sides of the assembly.

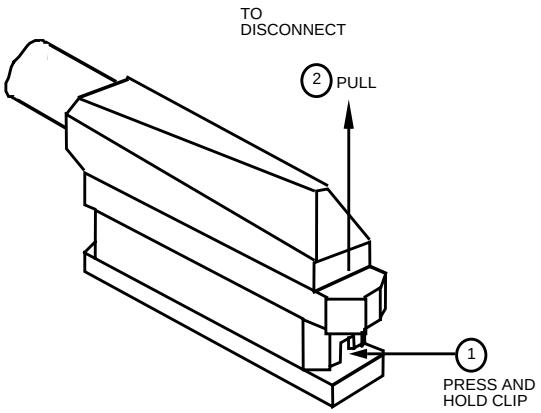


Figure 3-1. Cinch Type Connectors

D Type Connectors

D type connectors are provided in the system as DB9, DB25, DB37 pin arrangements.

Connectors as furnished on factory equipment (shelves and intershelf cable assemblies) are the insulation displacement (ID) type The D type connectors furnished for use by installers are also ID type requiring the use of special tools for wire insertion or replacement.

Each D type plug/jack connector combination has an associated covering (hood) which must be installed over the connector to complete the assembly. Figure 3-2 depicts the D type connectors and the hood/hardware assemblies for mating the connectors together.

Terminal numbers are embossed on the pin side of the assembly.

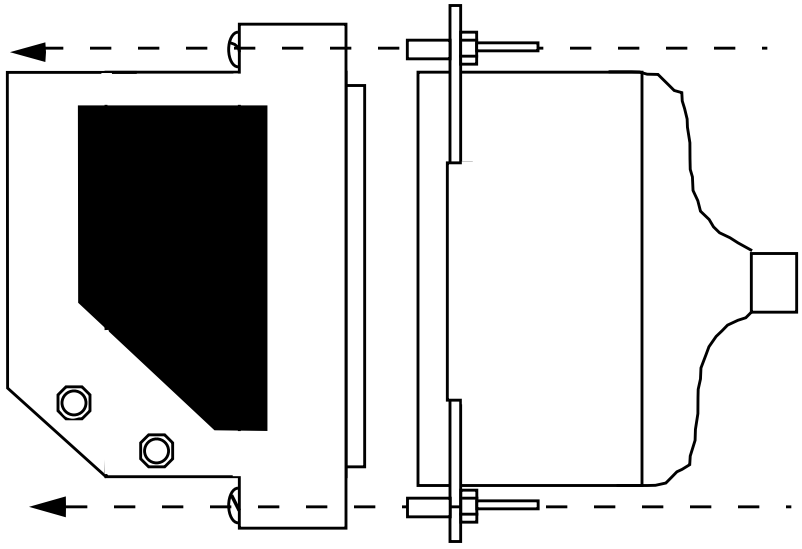


Figure 3-2. D Type Connectors

AMP Mate-N-Lok II* Connectors

AMP *Mate-N-Lok* II connectors are provided in various housings which accept a variety of pin sizes dependent upon the gauge of wires used. These pins are the crimp and solder type requiring only standard crimping and soldering tools. Each AMP *Mate-N-Lok* II connector is keyed to fit with its mating connector. Pin positions are identified by embossed numbers on the flat-sided surface areas of some positions. Consult Figure 3-3 for connector engagement and Figure 3-4 for pin replacement procedures.

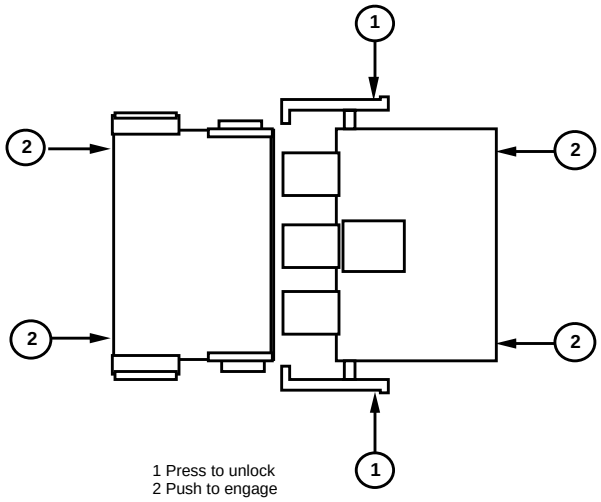


Figure 3-3. AMP *Mate-N-Lok* II Connectors

* Mate-N-Lok is a registered trademark of AMP, Inc.

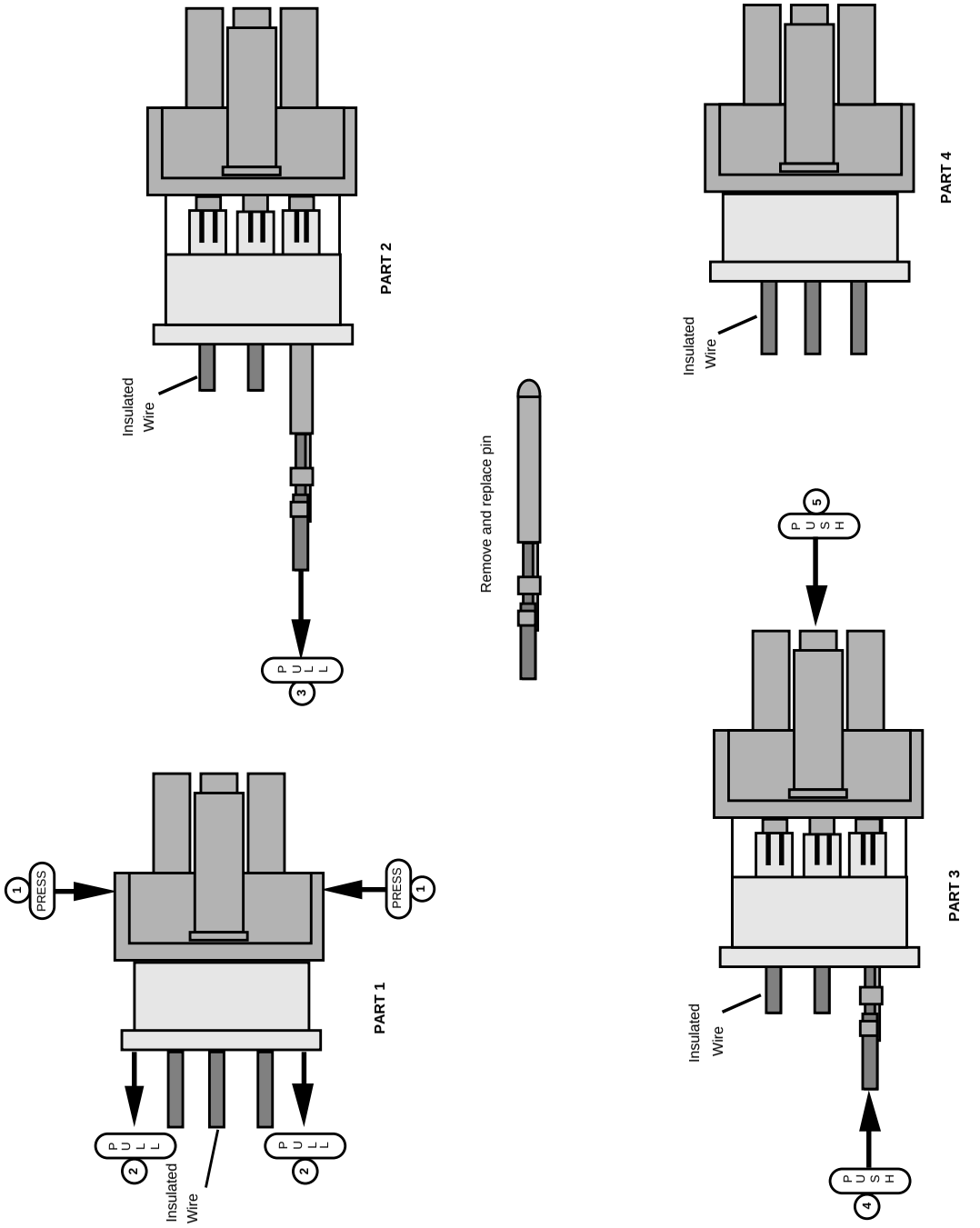


Figure 3-4. AMP *Mate-N-Lok* II Assembly

Installer Cabling Operations

General

The following sections detail all installer cables which can be connected to a *SLC*-2000 7-foot RT System. Customer Interface cables are those which interconnect to the office peripherals and ancillary equipment. Intrabay assemblies are the shelf dangler cables and the separate Standard Bay Cable Assemblies.

NOTE:
Not every interface connection is required. The engineering specification or installation order must specify which cables are required. Figure 3-6A illustrates all the connections and cable assemblies necessary for a complete *SLC*-2000 RT Bay installation configured for metallic distribution. For fiber distribution systems (FITL) refer to Figure 3-6B.

All connectors for terminating at the *SLC*-2000 bay are provided by the manufacturer with the equipment. These connectors are part of factory assembled shelf dangler cable assemblies which can be accessed in the frame's duct. Installers must mate the customer cables to these connectors for the connections to the customer's facilities. There are no direct connections to the shelves' connectors or backplanes.

Some Customers Interface cables (ED7C723-35) are complete cable assemblies equipped with connectors at one end by the manufacturer (refer to the PARTS LISTS chapter). These cable assemblies can be identified for their use by noting the jack or plug designation number. Refer to Figure 3-6() to determine the mating connection. Other customer cable assemblies must have both ends prepared by the installer. To facilitate these operations associated pin/wire color coding has been provided.

All cable connectors must be accessed at the front of the frame. Cable assemblies must be dressed and oriented with their hood coverings so that all cables exit downwards towards the rear of the duct in the area just below the equipment shelves. The mating connectors must be oriented so that the cables exit upwards in the cable duct towards the overhead cable rack. Prepare this routing carefully to minimize congestion in the duct especially when two adjacent bays share the duct space. Refer to Figure 3-5.

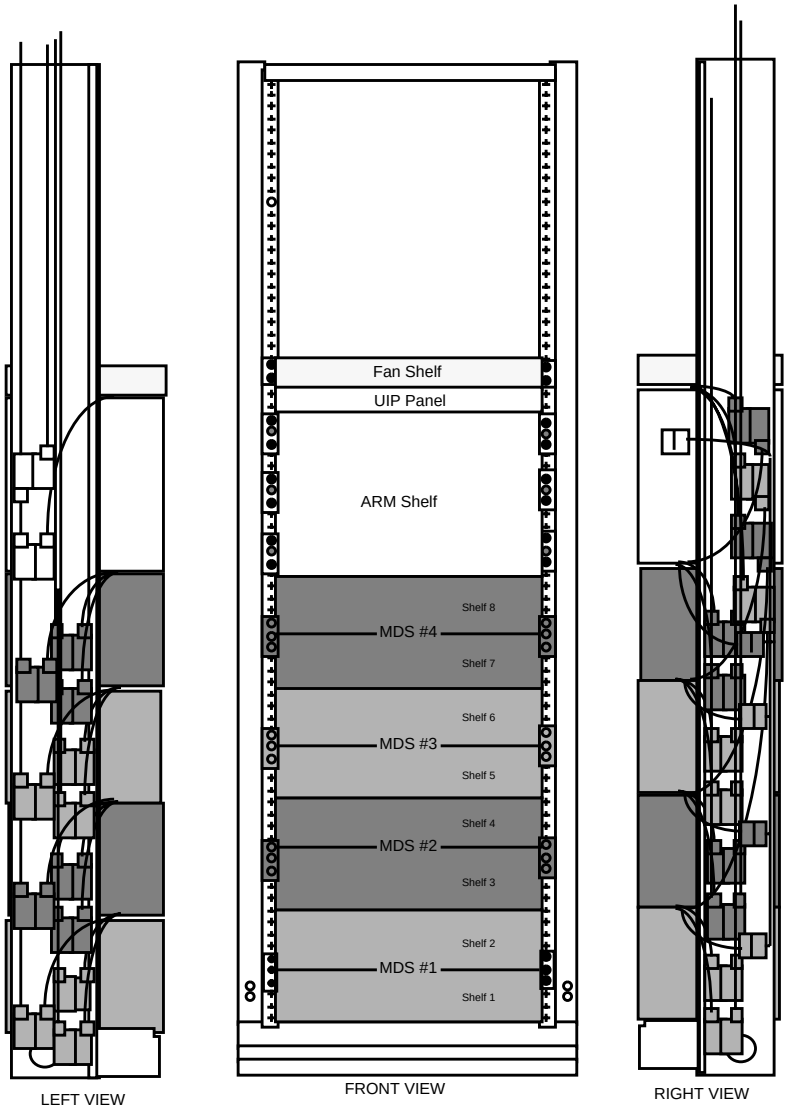


Figure 3-5. *SLC*-2000 RT Typical Cable Routing

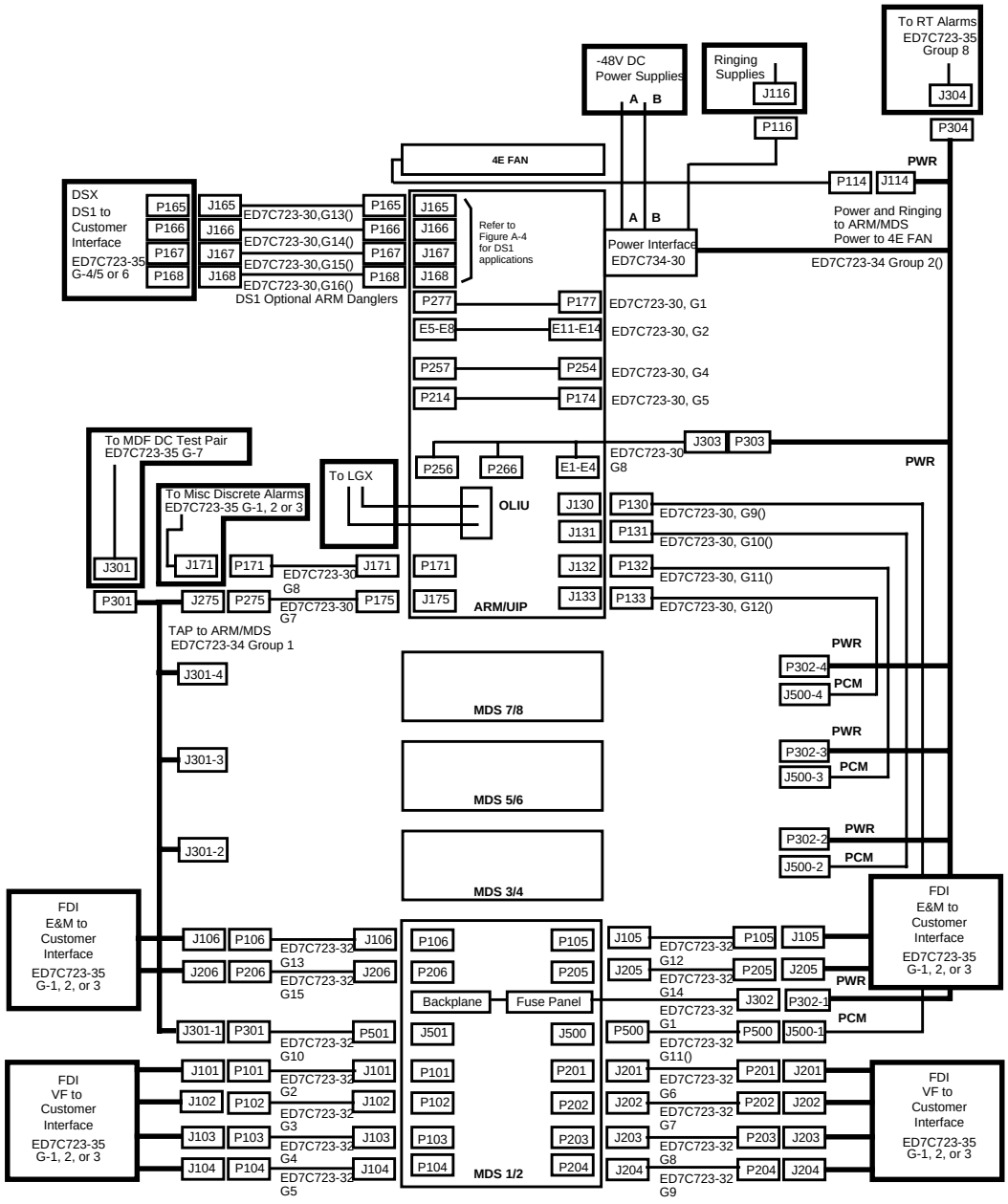


Figure 3-6A. RT Bay Cable Assemblies for Metallic Distribution Application

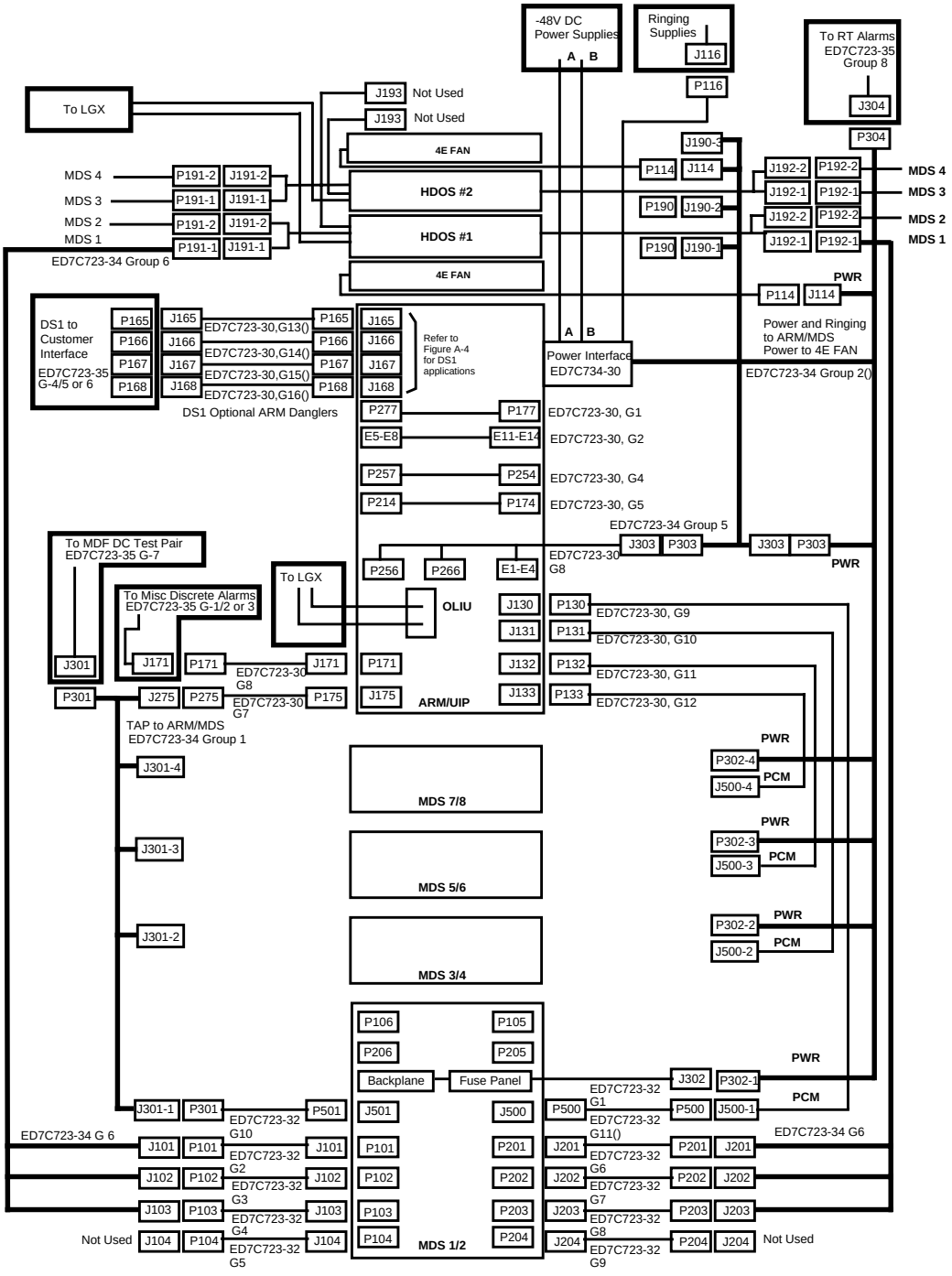


Figure 3-6B. RT Bay Cable Assemblies for Fiber Distribution (FITL) Application

Shelf Cables Verification

Verify that each shelf has been provided with its standard and optional cable assemblies and that the connectors have been routed to the appropriate cable duct (right or left). Refer to the following table and Figures 3-7 and 3-8.

Table 3-1. Cable Verification for ARM and MDS Shelves

	Cable Assembly	Left Duct	Right Duct
ARM	ED7C723-30, G7	P275	
	ED7C723-30, G8	P171	
	ED7C723-30, G9()*		J500-1
	ED7C723-30, G10()		J500-2
	ED7C723-30, G11()		J500-3
	ED7C723-30, G12()		J500-4
	ED7C723-30, G13()**	J163/J164	
	ED7C723-30, G14()**	J161/J167	
	ED7C723-30, G15()**	J162/J166	
	ED7C723-30, G16()**	J160/J168	
MDS	ED7C723-32, G1		J302
	ED7C723-32, G2	P101	
	ED7C723-32, G3	P102	
	ED7C723-32, G4	P103	
	ED7C723-32, G5	P104	
	ED7C723-32, G6		P201
	ED7C723-32, G7		P202
	ED7C723-32, G8		P203
	ED7C723-32, G9		P204
	ED7C723-32, G10	P301	
	ED7C723-32, G11()		P500
	ED7C723-32, G12		P105
	ED7C723-32, G13	P106	
	ED7C723-32, G14		P205
	ED7C723-32, G15	P206	

* The parenthesis after the group number of the cable assembly means that there may be an alpha character after the numeric character, e.g., Group 2 or Group 2A or Group 2B.

** Part of ED7C723-31, G2() Optional DS1 Distribution/Feeder Cable

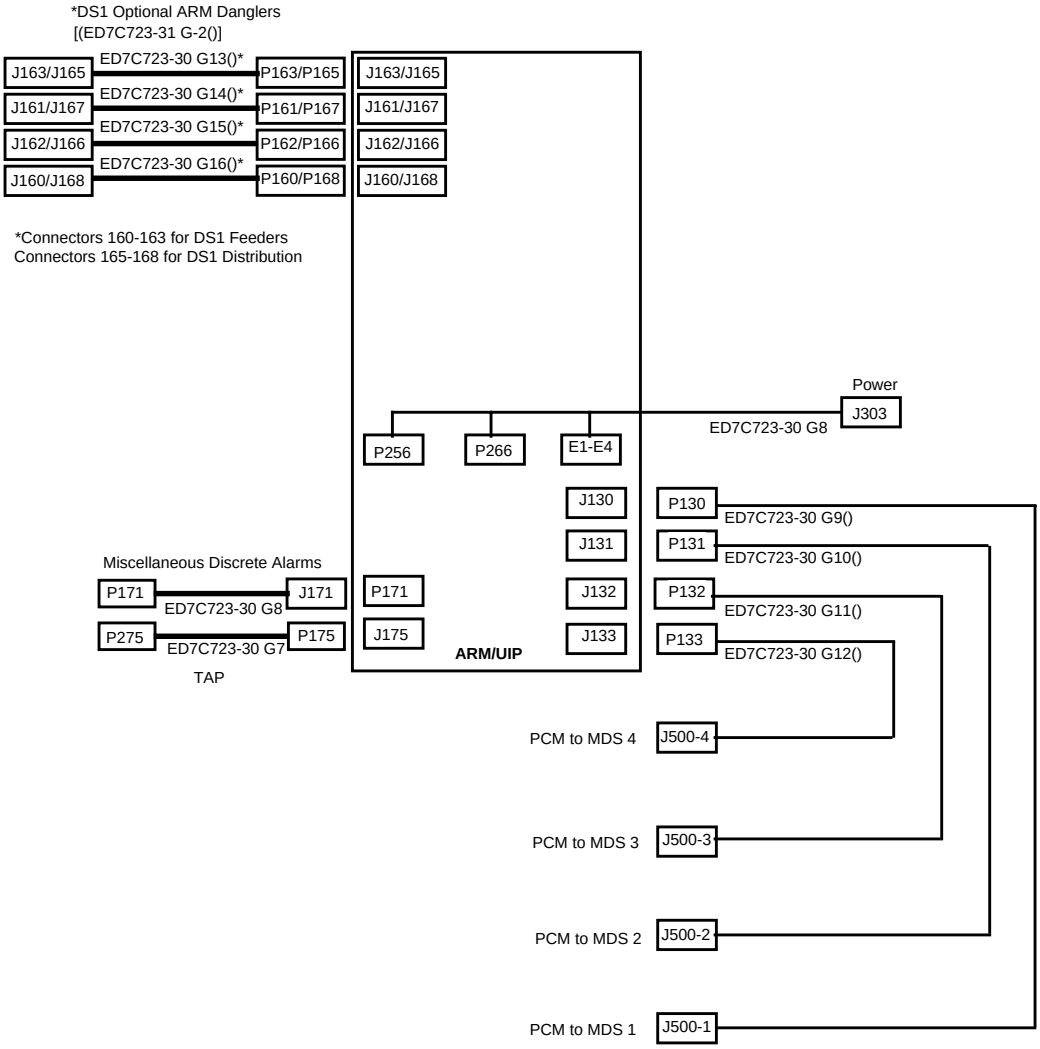


Figure 3-7. ARM Shelf Cable Assemblies

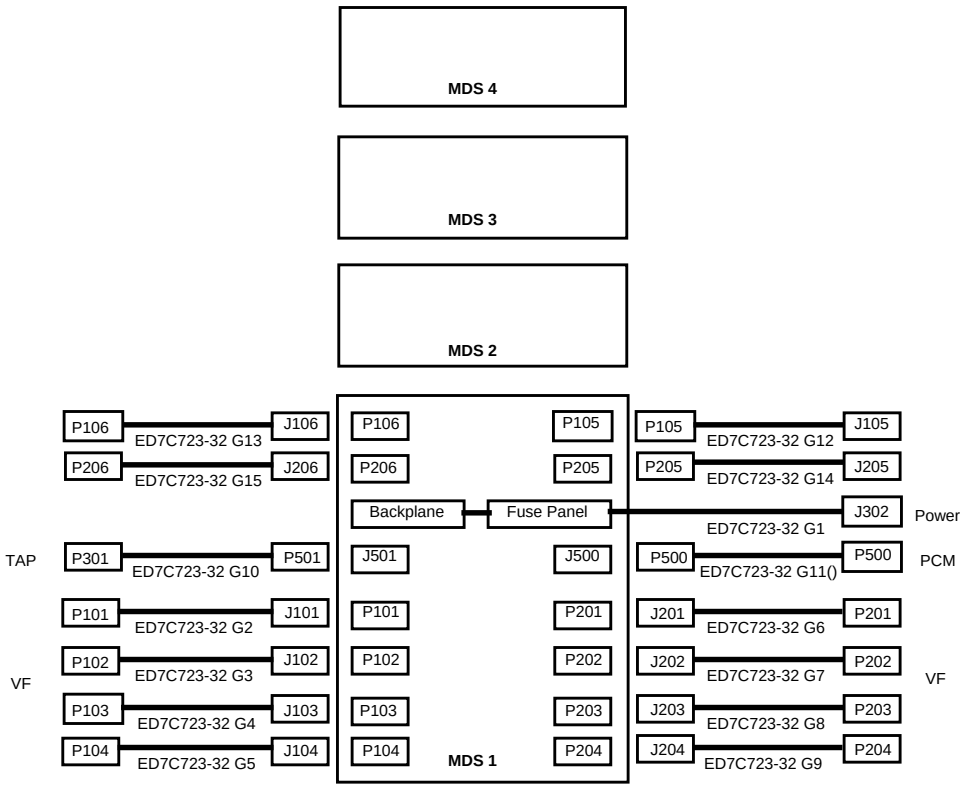


Figure 3-8. MDS Shelf Cable Assemblies

Bay Local Cable Connections

The following sections detail each installer operation necessary to interconnect the Standard Bay Cables and the Shelf Dangler Cables. For ease of installation and to alleviate cable duct congestion these procedures should be followed in the sequence presented. Details of these procedures are outlined in the respective sections.

NOTE:
If the bay has been factory assembled (J1C265A-1) then the following operations are verification items only.

Common Sections	Description of Operations
Power & Ringing Interface	Install the Power Interface Unit (ED7C734-30) and its cable assembly. Mate the cable assembly's connectors to their associated shelf dangler cable connectors.
PCM	Mate the PCM Intrabay Cable Assemblies [ED7C723-30 Groups 9() to 12()] connectors to their associated MDS shelf connectors.
Test Access	Install the TAP Standard Bay Cable Assembly (ED7C723-34 Group 1) and mate its Test Access Path (TAP) connectors to the associated shelf dangler cable connectors.
Fan Unit	Connect the Fan Shelf Cable.
DS1	Install Optional DS1 ARM Dangler Cables [ED7C723-30 Groups 13() to 16()]. Install Optional DS1 MDS Dangler Cables (ED7C723-32 Groups 6, 7, 8, & 9).
HDOS Sections	**Description of Operations**
Power	Install the HDOS/Fan Power cable assembly (ED7C723-34 Group 5) and mate the cable's connectors to the PIU cable assembly.
Transmission	Install the HDOS Transmission cable assemblies (ED7C723-34 Group 6) and mate their connectors to the HDOS and MDS shelf dangler cables.
DSX-1 Section	**Description of Operations**
Transmission	Install the DSX-1 Transmission cable assemblies (ED7C723-35 Group 17) and mate their connectors to the MDS shelf dangler cables. Install the DSX-1 Transmission cable assemblies (ED7C723-35 Groups 19 through 22) and mate their connectors to the ED7C723-35 Group 17 cable. Install the DSX-1 Transmission cable assemblies (ED7C723-35 Group 18) and mate their connectors to the HDOS shelf.

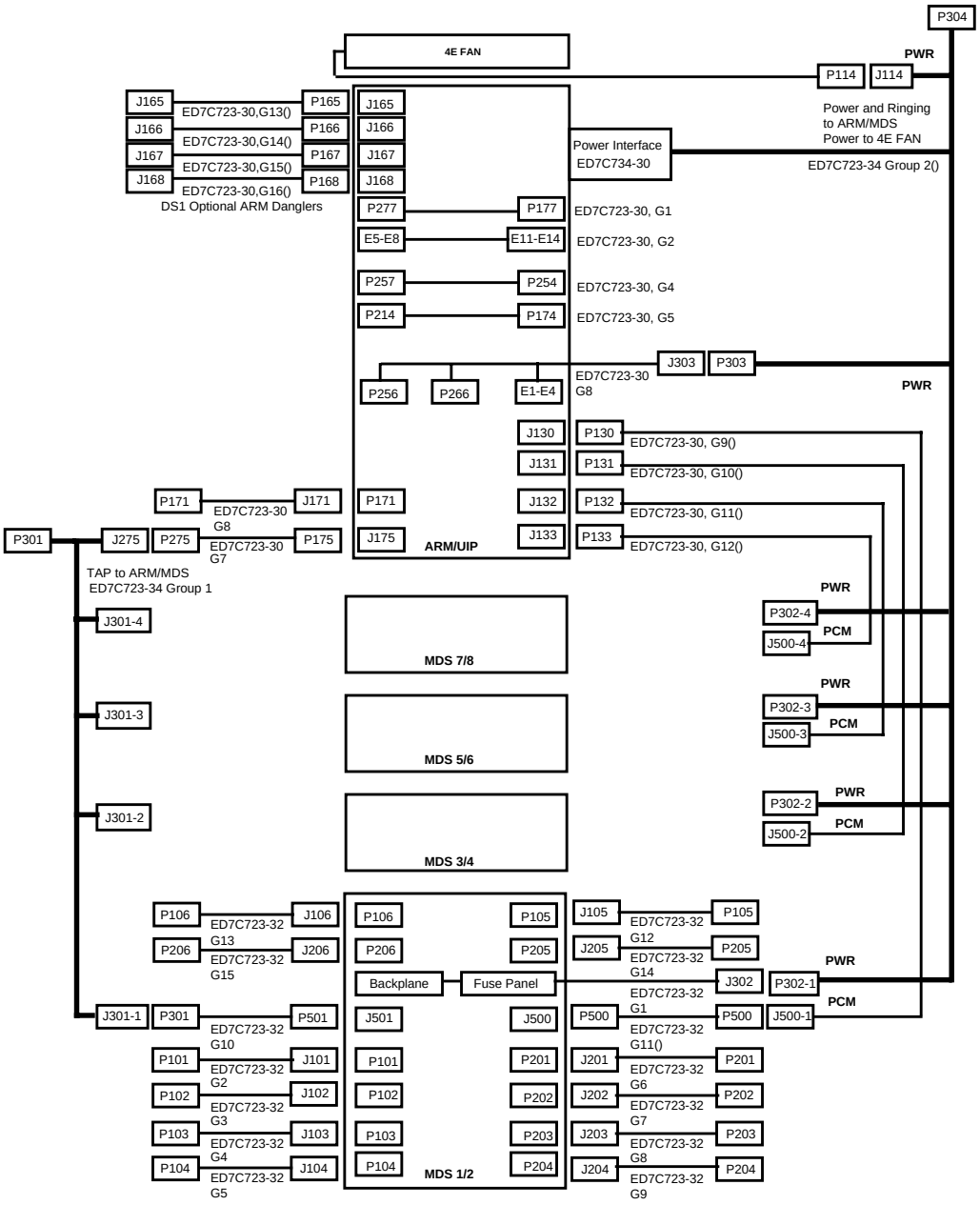


Figure 3-9A. RT Bay (Metallic) Intershelf Connections

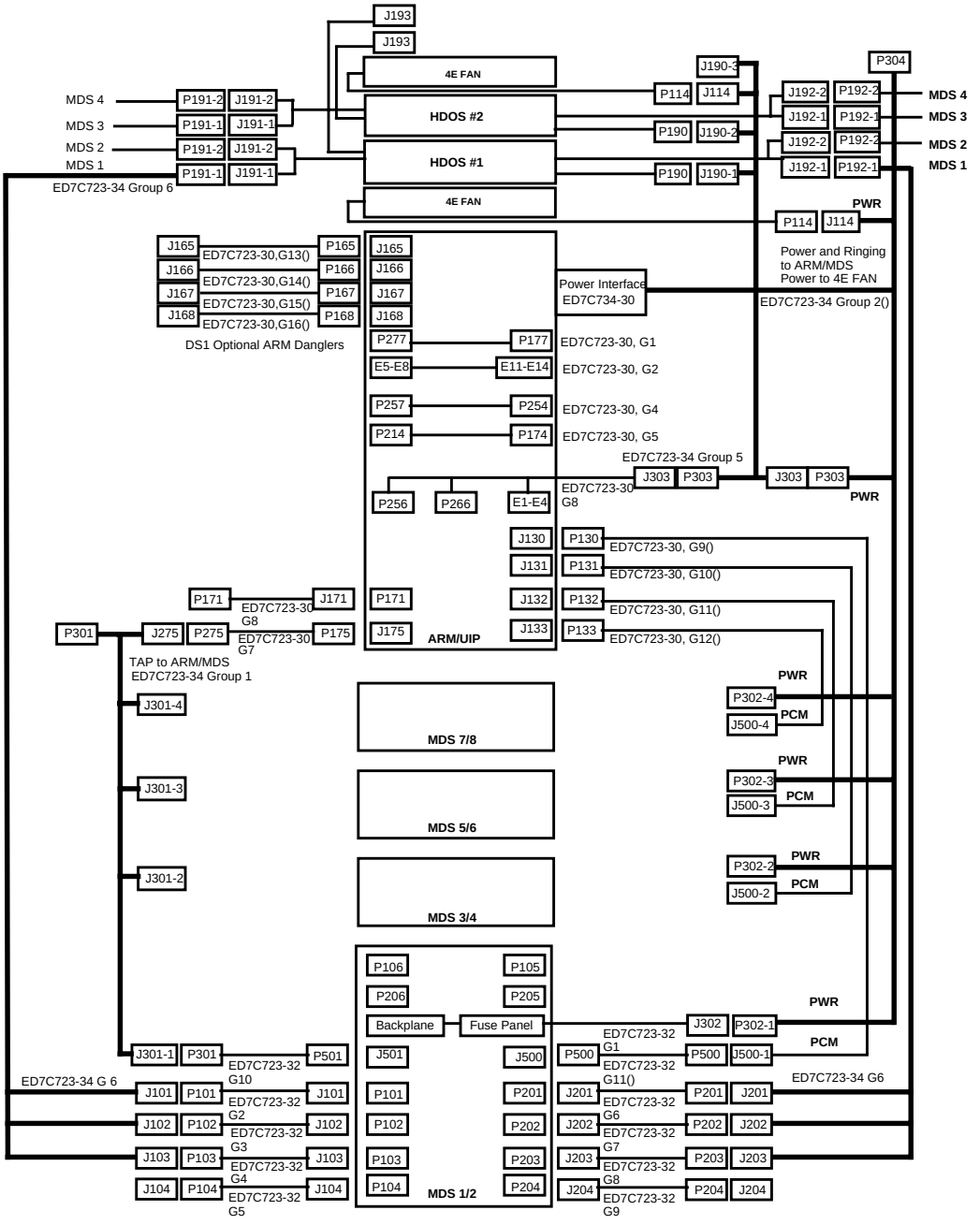


Figure 3-9B. RT Bay (Fiber Application) Intershelf Connections

Power and Ringing Local Interfaces

NOTE:
Verify that no *SLC* -2000 Circuit Packs are inserted.

NOTE:
If the Power Interface Unit (ED7C734-30) and the Standard Bay Cable Assembly [ED7C723-34 Group 2()] have been shipped as two separate items then it would be more efficient to mate the two pieces before installing in the frame duct. Refer to the INSTALLATION PROCEDURES chapter (Page 2-13).

Power Interface Unit/Standard Bay Cable Connections

Step 1: Open the Power Interface Unit and connect/verify the Bay Cable Assembly as follows:

Unit Terminal	Cable Color Code
1	R (2 wires)
2	BK (2 wires)
3	R and R-BK
4	BK and BK-R
5	BL-BK (2 wires)
6	W-BL (2 wires)
7	Y-BL (2 wires)
8	O-BK (3 wires)
9	W-O (3 wires)
10	Y-O (3 wires)

Power and Ringing Bay Cable Assembly ED7C723-34 Group 2()

Step 2: Refer to the Figure 3-10 and connect the Power Interface dangler cable assembly as follows in the right side cable duct:

Dangler Connector	Mating Connector	Comment
P304	-------	to be connected later
J114	P114 Fan Shelf	to be connected later
P303	J303 ARM	consult Figures 3-10 and 3-12
P302-4	J302 MDS 4	consult Figures 3-10 and 3-12
P302-3	J302 MDS 3	consult Figures 3-10 and 3-12
P302-2	J302 MDS 2	consult Figures 3-10 and 3-12
P302-1	J302 MDS 1	consult Figures 3-10 to 3-12

NOTE:
Position the unused/unassigned connectors so that future access for additional growth shelves is possible. After the connections have been made tie the cable assembly down towards the rear of the right duct.

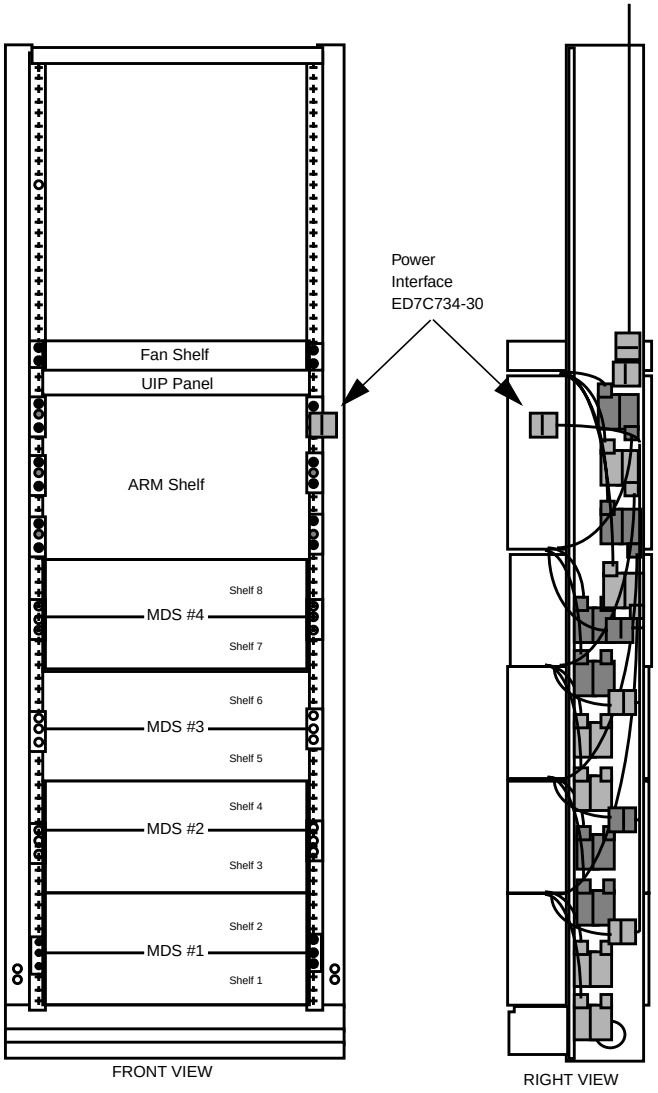


Figure 3-10. Power Interface Location

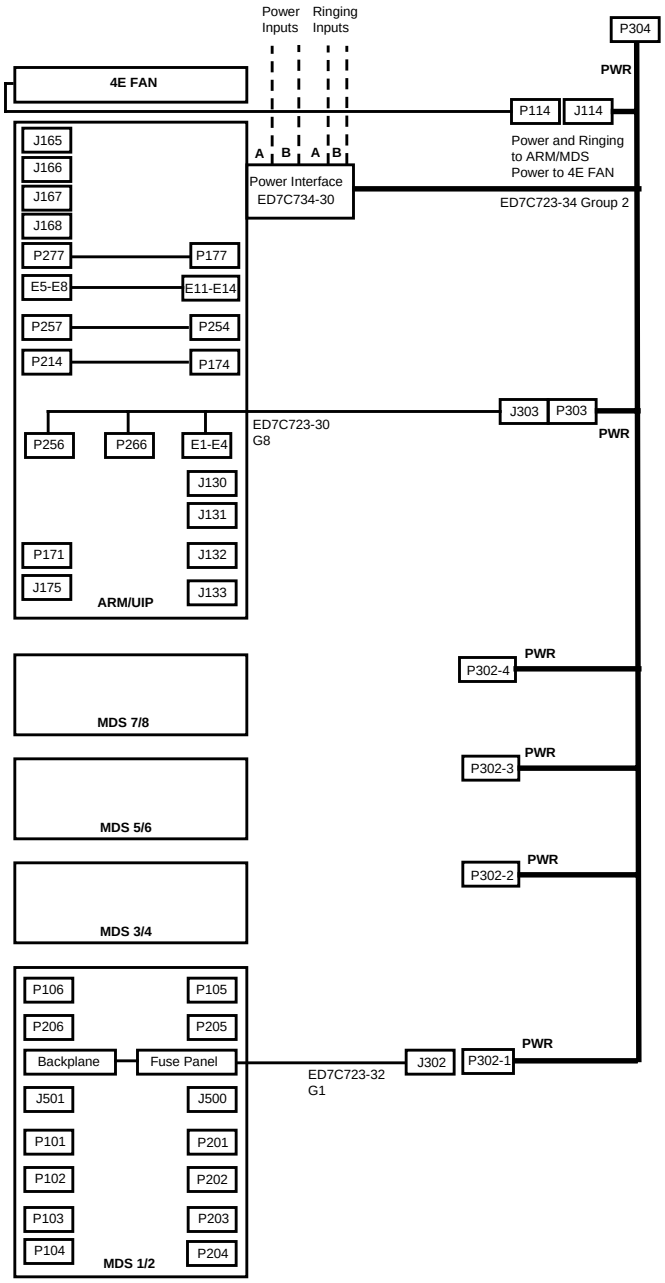


Figure 3-11. Power and Ringing Connections

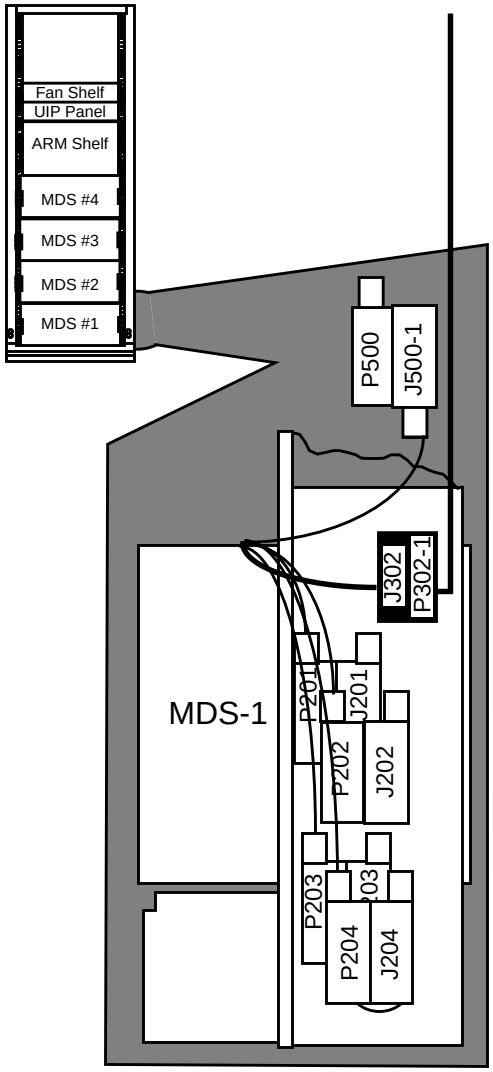


Figure 3-12. MDS Power Cabling

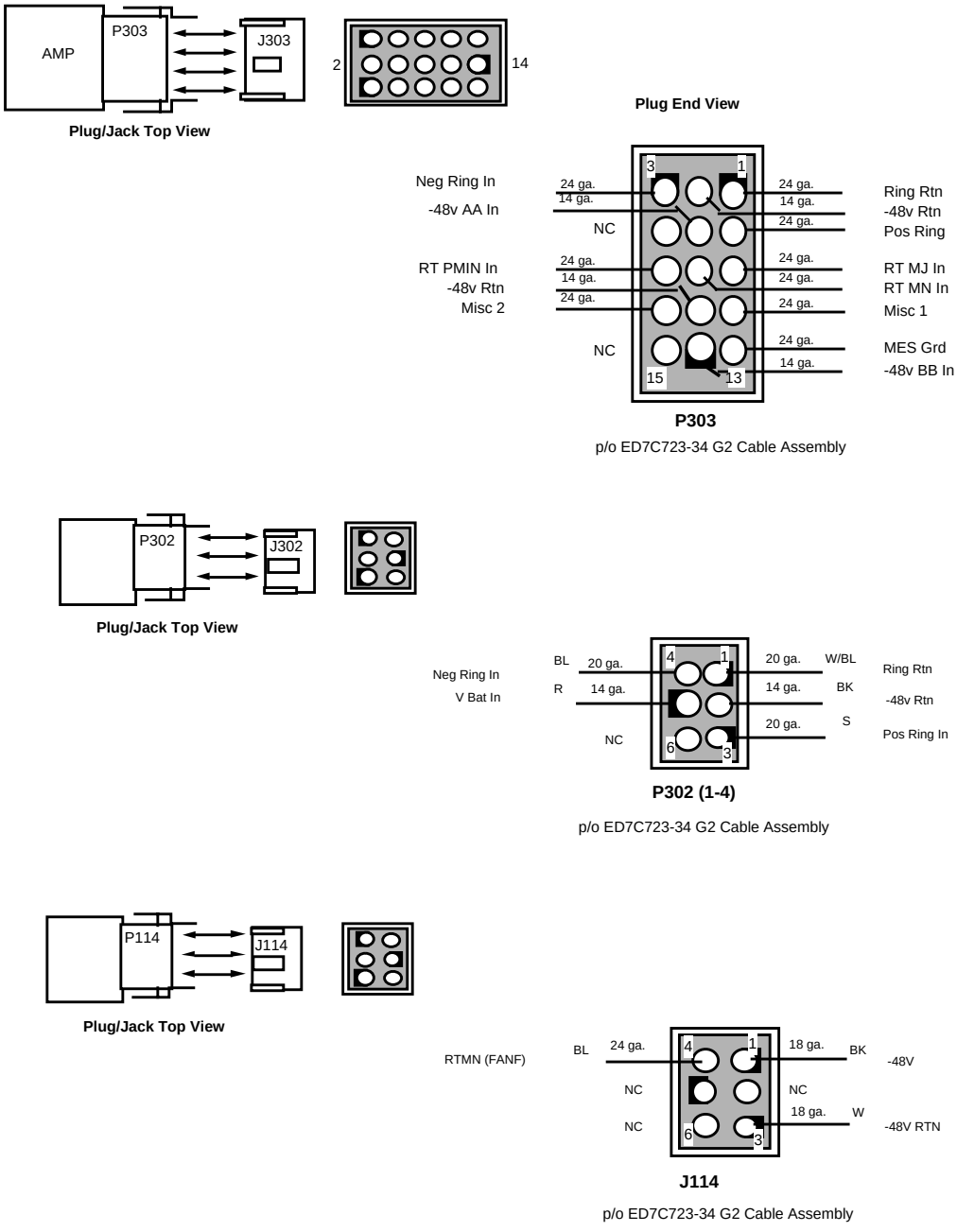


Figure 3-13. Power Connections

Fan Shelf Power Cable

General

NOTE:
This procedure consists of mating the Fan Shelf connector to the Standard Bay Cable Assembly [ED7C723-34 Group 2()] which had been installed earlier or to the HDOS Power Cable Assembly (ED7C723-34 Group 5) which is installed in the HDOS Interconnections section.

NOTE:
Pin 2 is not assigned. Fan Fail (FANF) lead pin 4 is multipled with other RT Minor Input Alarms (rectifier, ringing generator) at the J304 connector of the bay local cable.

Connections

Step 1: Route the Fan Shelf's cable under the Fan Shelf from the left side (front), over the top of the ARM shelf (or the HDOS), to the right cable duct.

Step 2: Mate the P114 connector to the J114 connector of the Power Interface Cable Assembly [ED7C723-34 Group 2() or 5] previously installed.

Step 3: Tie the cable to the ARM Shelf cables in the left and right cable ducts.

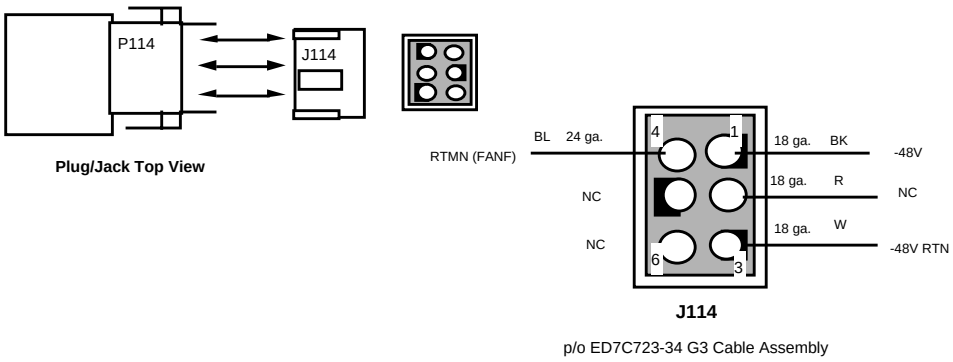


Figure 3-14. Fan Connections

PCM Connections

Connecting Procedure for Cable Assemblies ED7C723-30 Groups 9() to 12()

NOTE:
This procedure consists of mating the ARM Shelf PCM Dangler Cable Assemblies (ED7C723-30 Groups 9() to 12(), Figure 3-15) to each MDS Shelf Dangler Cable Assembly [ED7C723-32 Group 11()] which has been furnished as part of the MDS assembly.

NOTE:
Verify that unassigned connectors (for unfurnished MDS assemblies) have their protective caps installed.

Connections

Step 1: Mate the ARM Shelf PCM dangler Cable Assembly connector J500 () in the right duct with its MDS shelf P500 counterpart in accordance with the following assignment:

ARM Shelf Connector	MDS
J500-1	1
J500-2	2
J500-3	3
J500-4	4

Step 2: Position the cables in the right side duct in accordance with Figure 3-16.

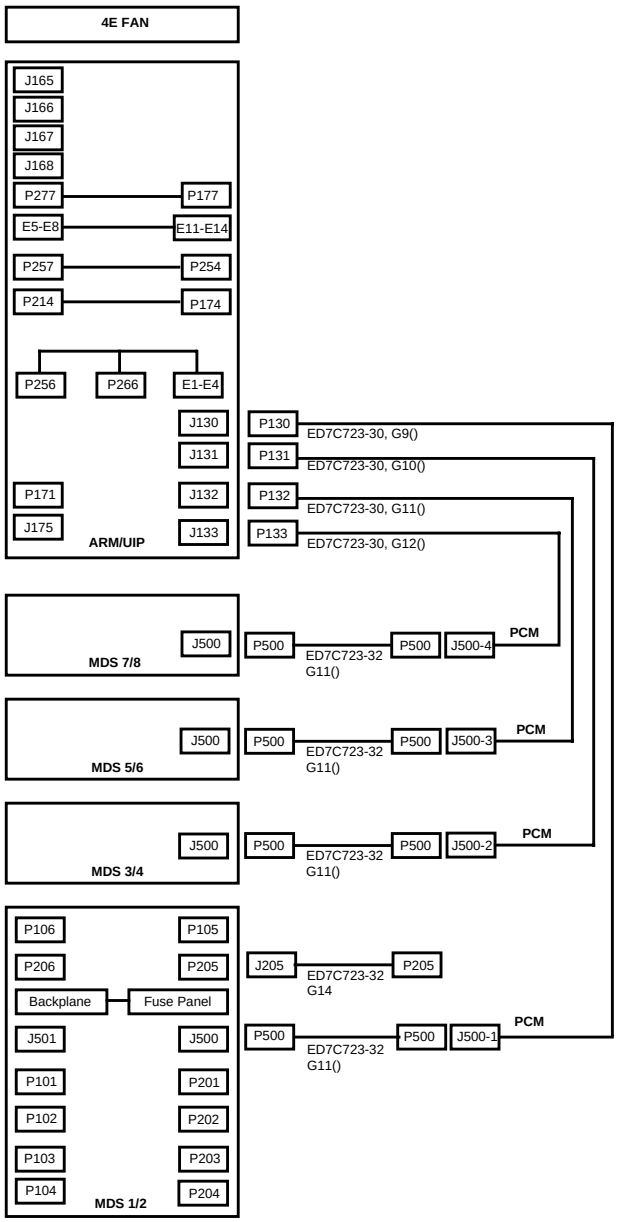


Figure 3-15. PCM Bay Cables [ED7C723-30 G9() - 12()]

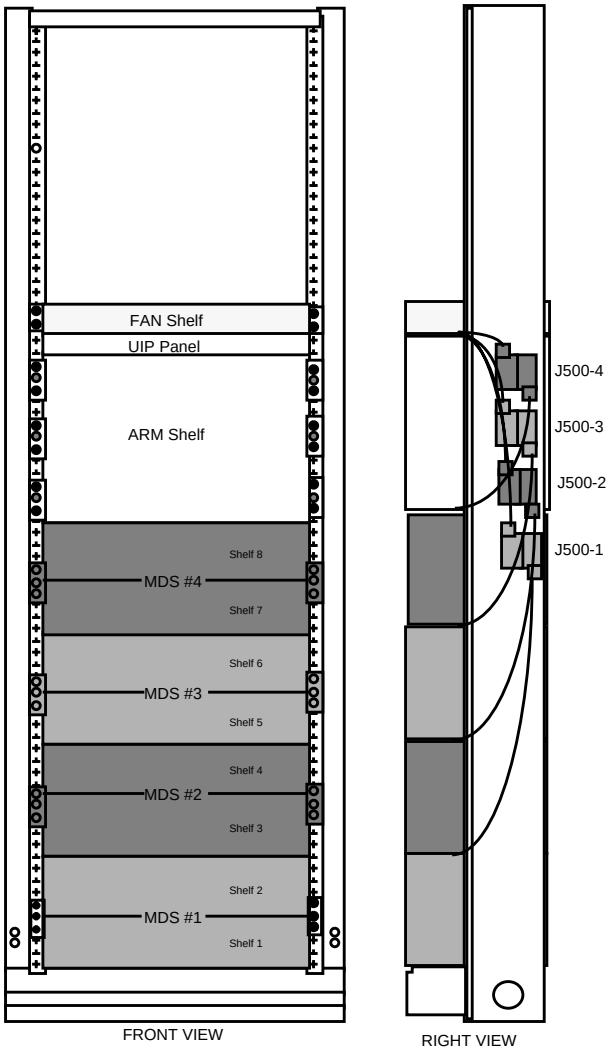


Figure 3-16. PCM J500() Connections

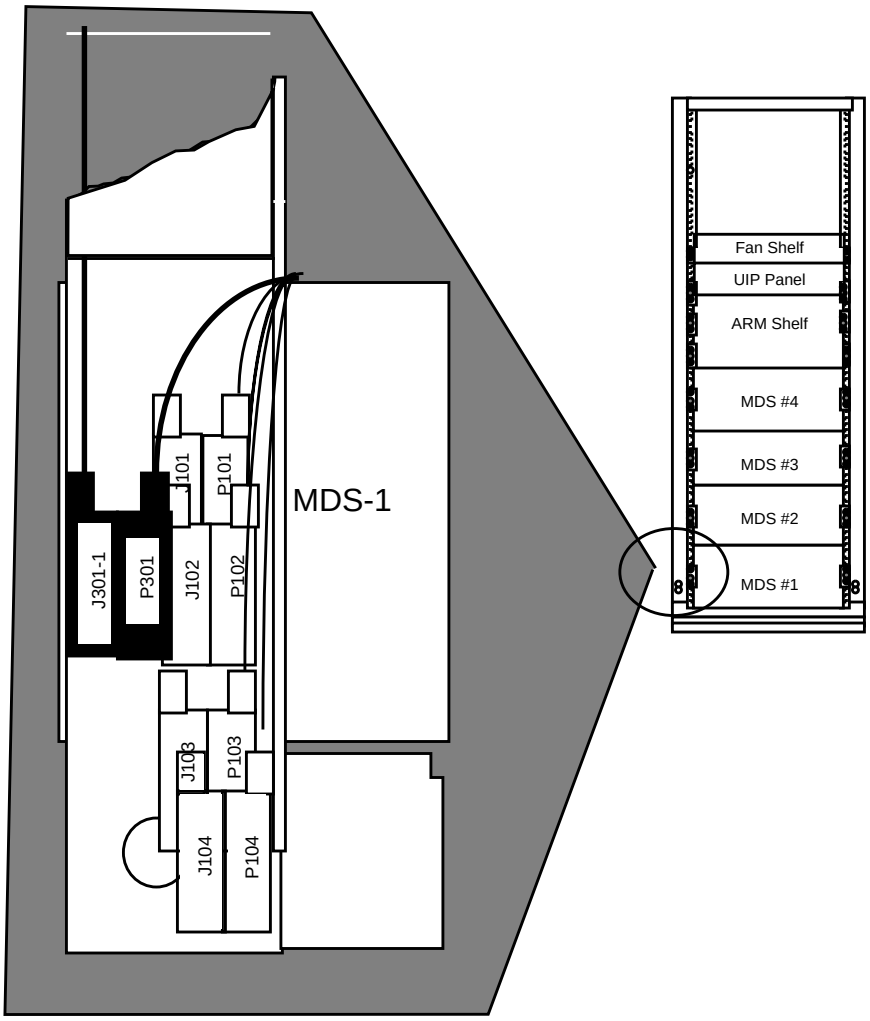
Test Access Path (TAP) Interface

TAP Bay Cable Assembly ED7C723-34 Group 1

Step 1: Refer to Figures 3-17 and 3-18 connect the TAP Interface cable assembly as follows in the left side cable duct:

TAP Connector	Mating Connector
P301	to be connected later
J275	P275 ARM Shelf
J301-4	P301 MDS 4
J301-3	P301 MDS 3
J301-2	P301 MDS 2
J301-1	P301 MDS 1

Step 2: Position the unused/unassigned connectors so that future access for additional growth shelves is possible. After the connections have been made, tie the cable assembly down towards the rear of the left duct.



Left View

Figure 3-17. TAP Connection

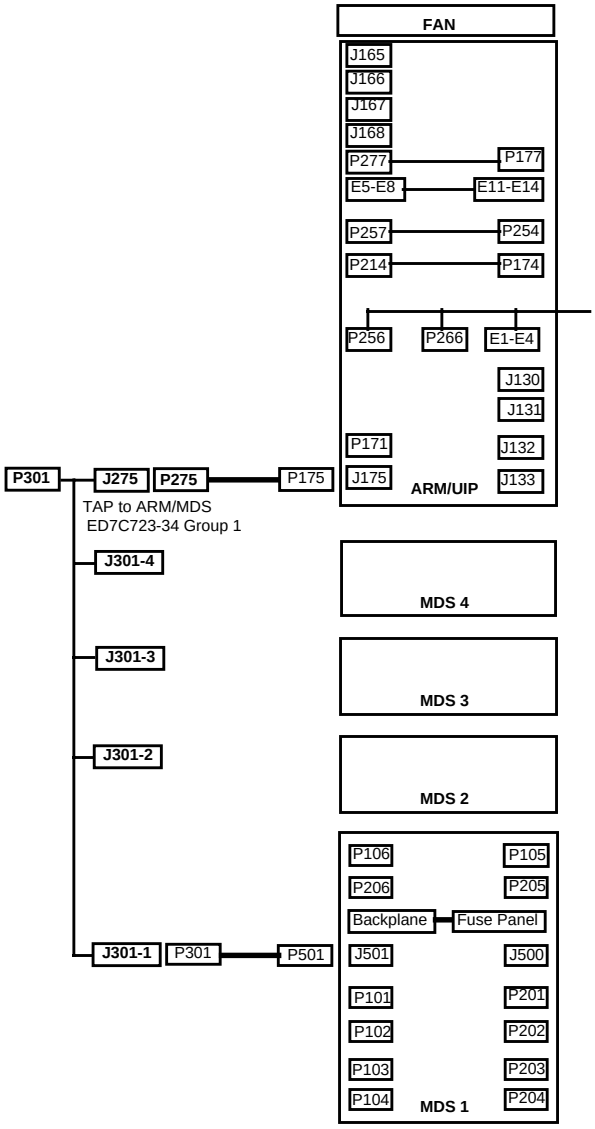


Figure 3-18. TAP Bay Connections

DS1 Connections

General

NOTE:
DS1 Distribution (connectors J165-J168 on the ARM shelf backplane) is associated with the “C” SONET multiplexer group and the DS1 (LS-C) circuit pack slots.

NOTE:
DS1 Feeder interface (connectors J160-J163 on the ARM shelf backplane) is associated with the “A” SONET multiplexer group and the LIU (LS-A) circuit pack slots.

NOTE:
The *SLC*-2000 System supports either DS1 Distribution or DS1 Feeder, but not both simultaneously. The same cable assemblies [ED7C723-30 Groups 13() to 16()] are utilized for either the A or C SONET multiplexer function group and can be moved to the associated connectors on the ARM backplane for their appropriate application.

NOTE:
Cable assemblies, ED7C723-30 Groups 13() to 16(), may be provided as part of the DS1 Distribution Cable Kit, ED7C723-31 Group 2().

Installation Procedure for DS1 Distribution/Feeder Cable Kit ED7C723-31 Group 2()

Step 1: ED7C723-30 Group 13(). Patch the P165/P163 connector of the cable assembly to the J165/J163 jack of the ARM backplane (DS1 OUT). Secure the connection with the attached connector screws.

Step 2: ED7C723-30 Group 15(). Patch the P166/P162 connector of the cable assembly to the J166/J162 jack of the ARM backplane (DS1 OUT). Secure the connection with the attached connector screws.

Step 3: Route these two cable assemblies up over the top of the ARM shelf and then towards the right (as viewed from the rear of the shelf). The ferrite beads should not lay upon each other. Refer to Figure 3-19.

Step 4: ED7C723-30 Group 14(). Patch the P167/P161 connector of the cable assembly to the J167/J161 jack of the ARM backplane (DS1 IN). Secure the connection with the attached connector screws.

Step 5: ED7C723-30 Group 16(). Patch the P168/P160 connector of the cable assembly to the J168/J160 jack of the ARM backplane (DS1 IN). Secure the connection with the attached connector screws.

Step 6: Route these two cable assemblies up over the top of the ARM shelf, over the top of the first two cable assemblies and then towards the right (as viewed from the rear of the shelf). The ferrite beads should not lay upon each other. Refer to Figure 3-19.

Step 7: Secure all four cable assemblies together with cable ties using the top of the ARM shelf's tie points. Refer to Figure 3-19.

Step 8: Let the cable J165 to J168 or J160 to J163 connectors dangle in the duct for future connections to the mating DSX cables.

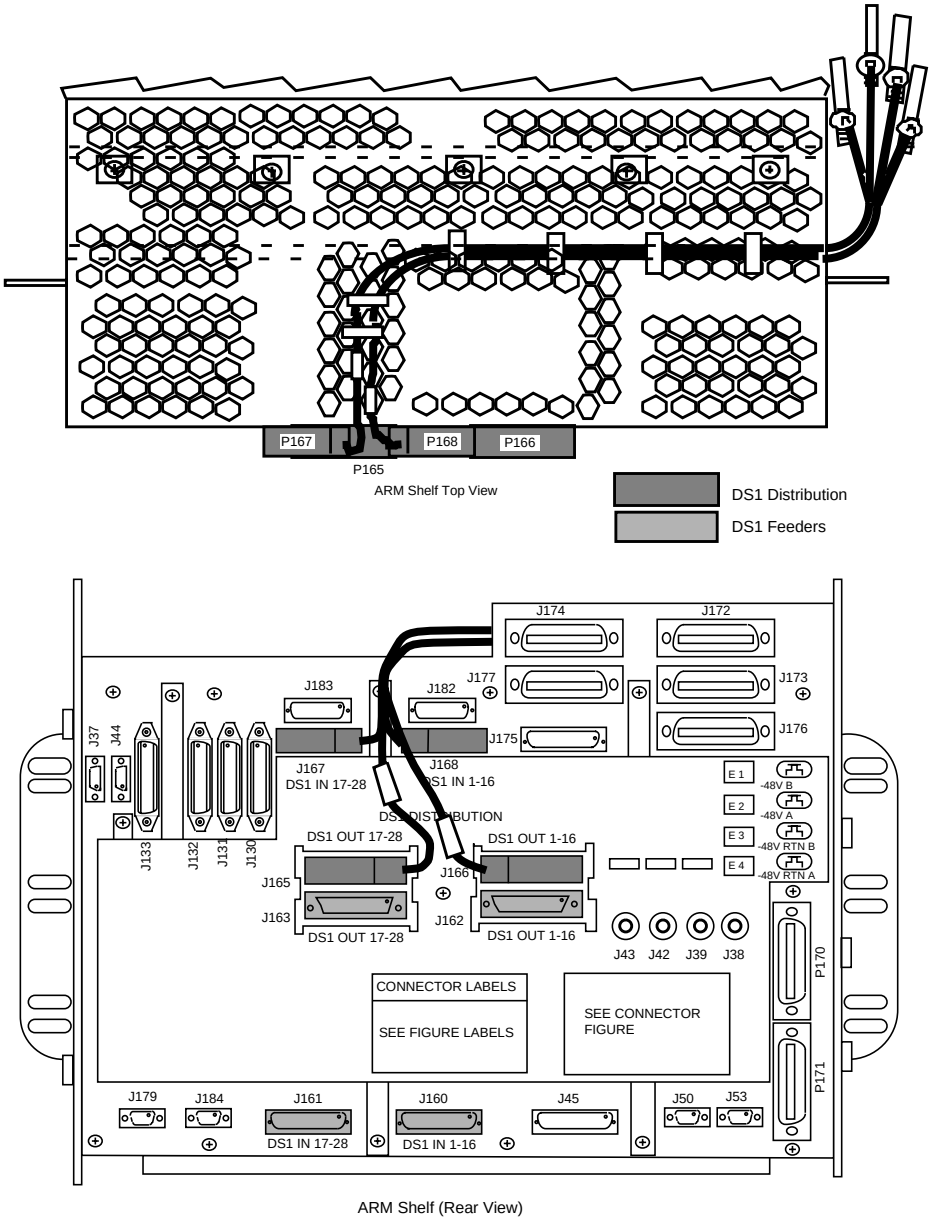


Figure 3-19. DS1 Distribution or Feeder Cable Kit Installation

HDOS Interconnections

General

Whenever the RT bay is configured for Fiber In The Loop (FITL) applications it serves as a Host Digital Terminal (HDT). The High Density Optics Shelf (HDOS) provides the interface between the electrical signals on the MDS backplane and the optical fiber medium to the Multi Services Digital Terminal (MSDT). Each HDOS can serve four (4) MDS shelves (2 MDS Assemblies). It is possible to have a combination of metallic (MDS connections to MDF/FDI) and fiber (MDS to HDOS) distribution applications. Refer to the local engineering job specification for these assignments.

The connections between the HDOS and the MDS are factory provided cable assemblies (ED7C723-34 Group 6) which must be connected between the HDOS dangler cables and the MDS Assembly dangler cables.

The HDOS is powered from the PIU by way of a second factory assembled Bay Power Cable (ED7C723-34 Group 5) which must be added to the first bay Power Cable [ED7C723-34 Group 2()] between the PIU and the ARM Shelf. This additional power cable also provides the power required for the additional Fan Shelf.

A single single-mode fiber (same fiber for both transmit and receive directions) is required to connect each equipped HDOS slot (up to 32 per HDOS) with the OSP fibers at the LGX.

Figures 3-20 and 21 are overviews of the required interconnecting cables for the FITL application.

Table 3-2 details the wiring interconnections between the HDOS and MDS shelves.

Connecting Procedure for Power Cable Assembly ED7C723-34 Group 5

This cable assembly when installed, will provide power to three HDOS shelves (the third is for future applications) as well as the required additional Fan Shelf. The dc power source is from the Power Interface Unit (PIU) and its attached ED7C723-34 Group 2() Cable Assembly. Refer to Figure 3-20 for an overview of the powering scheme.

It will be necessary to temporarily disconnect the PIU connection to the ARM shelf in order to install the ED7C723-34 Group 5 Cable Assembly.

Connections

Step 1: Locate the ED7C723-34 Group 2() Cable Assembly J303/P303 connector interface at the ARM Shelf. This cable is part of the PIU. Cut any ties as required to gain access to these connectors.

Step 2: Disconnect this ARM shelf connection and install the ED7C723-34 Group 5 Cable Assembly as follows:

a. Mate the P303 connector on the cable to the ARM shelf's J303 connector.

b. Mate the J303 connector on the cable to the PIU cable's (Group 2) P303 connector.

c. Mate the J190-1 connector on the cable to the first HDOS P190 connector.

d. Mate the J190-2 connector on the cable to the second HDOS P190 connector. If the second HDOS is not provided at this time leave the J190-2 connector visible in the area of the future shelf.

e. Leave the J190-3 connector on the cable visible in the area of a future third HDOS (above the other HDOS).

f. Mate the J114 connector on the cable to the Fan Shelf's P114 connector.

Step 3: Secure the cable assembly to the PIU's cable assembly wherever possible but leaving enough slack to reach the future HDOS positions.

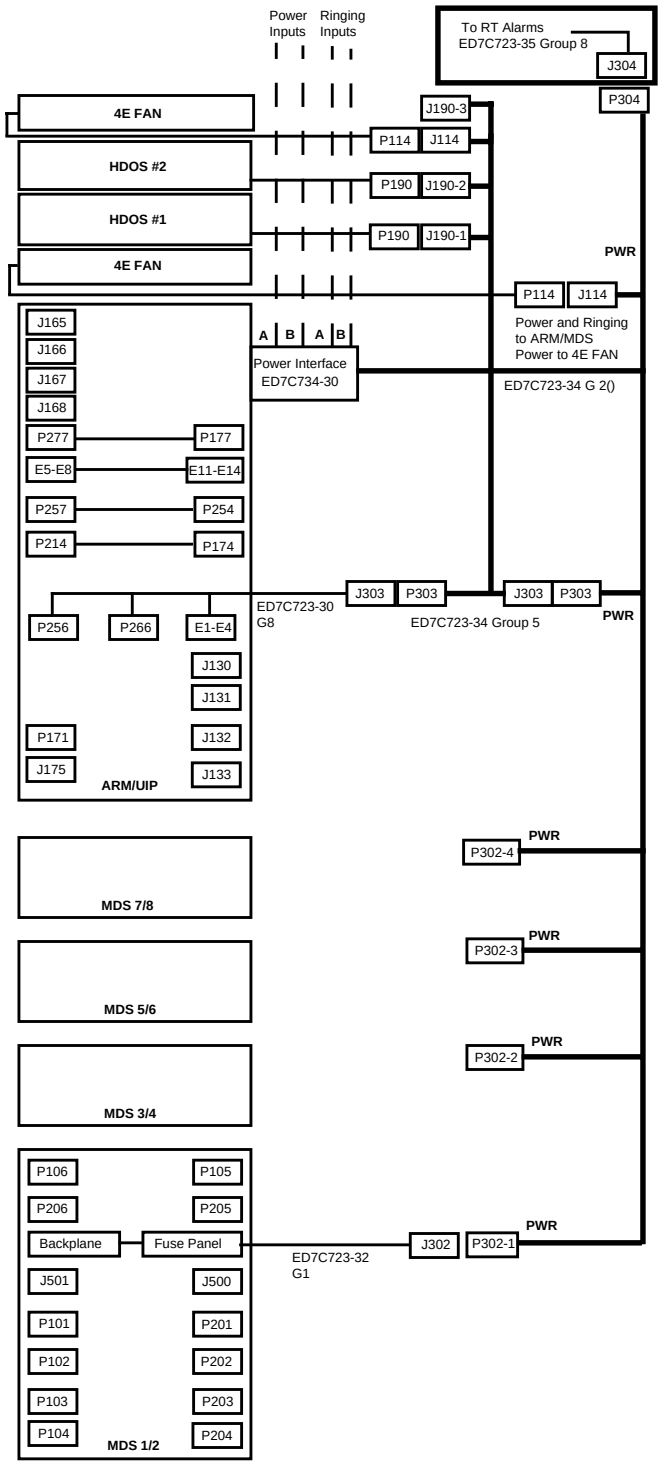


Figure 3-20. RT Bay Power Cable Assemblies for HDOS (FITL) Applications

Connecting Procedures for Transmission Cable Assembly ED7C723-34 Group 6

This procedure consists of installing the FITL HDOS to MDS Interconnect cables and mating their connectors to their respective shelf dangler cables.

Refer to Figure 3-21 and note that up to two HDOS shelves may be provided and up to eight cable assemblies connected for a complete RT Bay FITL application.

Note that the HDOS OU circuit pack positions have a similar numbering scheme as the MDS CU slots. This association can be used in troubleshooting and isolating problems relating to cable assignments. Refer to Table 3-2 for HDOS and MDS slot association.

NOTE:
There is no associated cable connection to the MDS connectors P104 or P204.

Connections

Step 1: Install the interconnecting cable assemblies in the appropriate duct and mate their connectors in accordance with the assigned MDS and HDOS positions.

NOTE:
The factory assembled cable connectors are universally stamped P191/P192, J101/J201, J102/J202, J103/J203. For ease of installation erase or cover that part of the label that is not relevant before mating to its associated connector. For example some relevant labeling would be:

a. P191-1, J101, J102, J103

b. P192-1, J201, J202, J203

Step 2: Tie the cables in the duct space wherever appropriate.

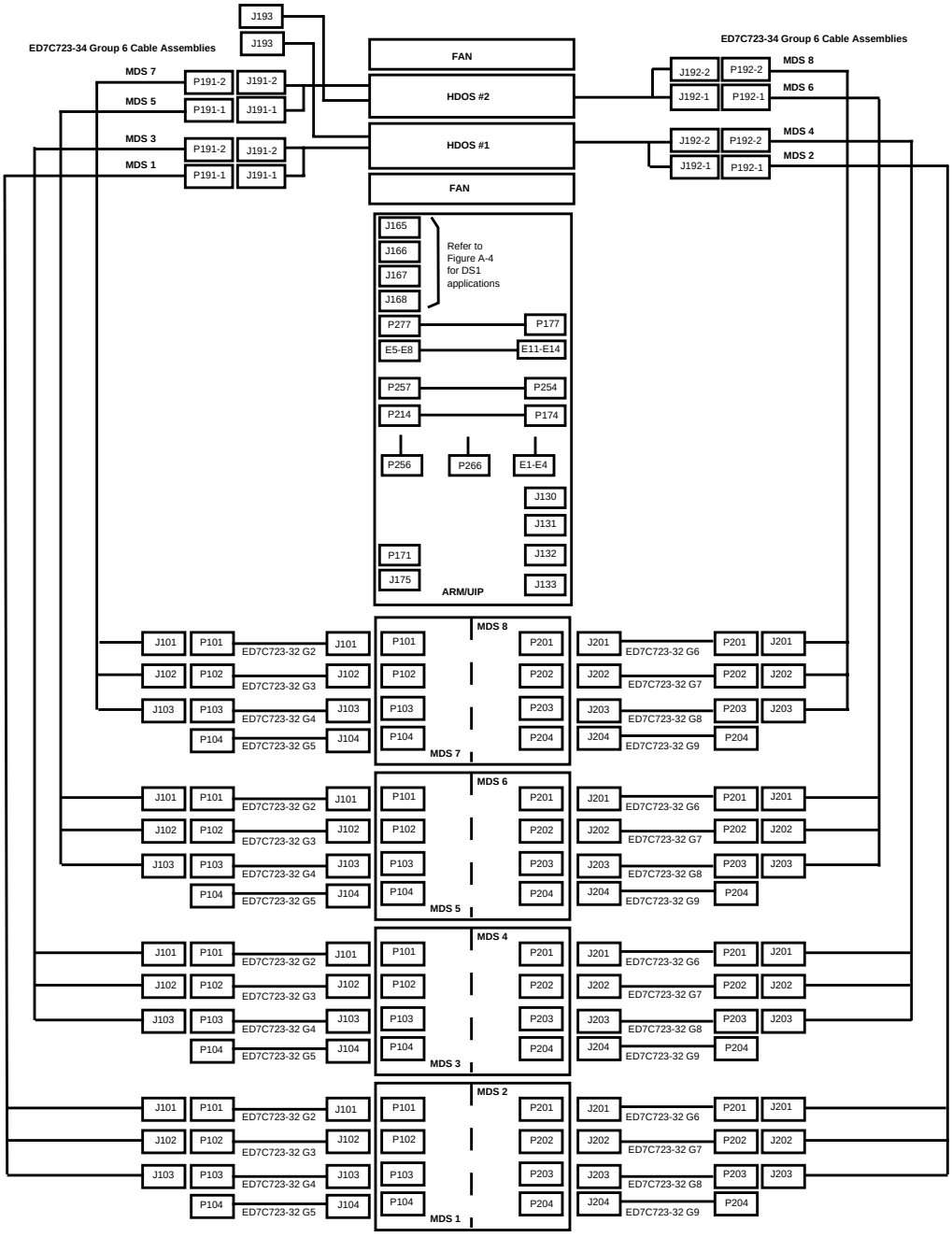


Figure 3-21. RT Bay Transmission Cable Assemblies for HDOS (FITL) Application

Table 3-2. HDOS/MDS Circuit Pack Slot Association

High Density Optics Shelf (HDOS)						Metallic Distribution Shelf (MDS)					
BP Conn	Pins T, T1, R, R1	OU Slot	Sys	Shelf Connector	Pins R, T, R1, T1	Shelf No.	Shelf Connector	Pins R, T, R1, T1	MSDT Server, MDS Slot CU ()	VF Ch Time Slot	
										12 Lines	24 Lines
J1	9,18, 8, 17	1	1	J191-1	1, 26, 2, 27	1 (5)	J101	1, 26, 2, 27	1	1-12	1-24
J2		3			3, 28, 4, 29			3, 28, 4, 29	3	13-24	
J3		5			5, 30, 6, 31			5, 30, 6, 31	5	25-36	25-48
J4		7			7, 32, 8, 33		J102	7, 32, 8, 33	7	37-48	
J6		13			9, 34, 10, 35			9, 34, 10, 35	13	49-60	49-72
J7		15			11, 36, 12, 37		J103	11, 36, 12, 37	15	61-72	
J8		17			13, 38, 14, 39			13, 38, 14, 39	17	73-84	73-96
J9		19			15, 40, 16, 41			15, 40, 16, 41	19	85-96	
J11		1	2	J192-1	1, 26, 2, 27	2 (6)	J201	1, 26, 2, 27	1	1-12	1-24
J12		3			3, 28, 4, 29			3, 28, 4, 29	3	13-24	
J13		5			5, 30, 6, 31			5, 30, 6, 31	5	25-36	25-48
J14		7			7, 32, 8, 33		J202	7, 32, 8, 33	7	37-48	
J16		13			9, 34, 10, 35			9, 34, 10, 35	13	49-60	49-72
J17		15			11, 36, 12, 37		J203	11, 36, 12, 37	15	61-72	
J18		17			13, 38, 14, 39			13, 38, 14, 39	17	73-84	73-96
J19		19			15, 40, 16, 41			15, 40, 16, 41	19	85-96	
J21		1	3	J191-2	1, 26, 2, 27	3 (7)	J101	1, 26, 2, 27	1	1-12	1-24
J22		3			3, 28, 4, 29			3, 28, 4, 29	3	13-24	
J23		5			5, 30, 6, 31			5, 30, 6, 31	5	25-36	25-48
J24		7			7, 32, 8, 33		J102	7, 32, 8, 33	7	37-48	
J26		13			9, 34, 10, 35			9, 34, 10, 35	13	49-60	49-72
J27		15			11, 36, 12, 37		J103	11, 36, 12, 37	15	61-72	
J28		17			13, 38, 14, 39			13, 38, 14, 39	17	73-84	73-96
J29		19			15, 40, 16, 41			15, 40, 16, 41	19	85-96	
J31		1	4	J192-2	1, 26, 2, 27	4 (8)	J201	1, 26, 2, 27	1	1-12	1-24
J32		3			3, 28, 4, 29			3, 28, 4, 29	3	13-24	
J33		5			5, 30, 6, 31			5, 30, 6, 31	5	25-36	25-48
J34		7			7, 32, 8, 33		J202	7, 32, 8, 33	7	37-48	
J36		13			9, 34, 10, 35			9, 34, 10, 35	13	49-60	49-72
J37		15			11, 36, 12, 37		J203	11, 36, 12, 37	15	61-72	
J38		17			13, 38, 14, 39			13, 38, 14, 39	17	73-84	73-96
J39		19			15, 40, 16, 41			15, 40, 16, 41	19	85-96	

DSX-1 Interconnections

General

Whenever the RT bay is configured for DDM-2000 FiberReach applications it serves as a Host Digital Terminal (HDT). The DSX-1 panel provides the interface between the electrical signals on the MDS backplane and the electrical signals of the DDM-2000 shelf, or MSDT or FSM applications that use a T-Carrier facility. It is possible to have a combination of metallic (MDS connections to MDF/FDI) and fiber (MDS to HDOS) distribution applications. Refer to the local engineering job specification for these assignments.

The connections between the DSX-1 and the MDS are factory provided cable assemblies (ED7C723-35 Group 17) which must be connected between the ABAM cables and the MDS Assembly dangler cables.

Figures 3-22 is the overview of the required interconnecting cables for the MDS/ DSX-1 application.

Connecting Procedures for Transmission Cable Assembly ED7C723-35 Group 17

This procedure consists of installing the DSX-1 to MDS Interconnect cables and mating their connectors to their respective shelf dangler cables.

Connections

Step 1: Install the interconnecting cable assemblies in the appropriate duct and mate their connectors in accordance with the assigned MDS positions.

NOTE:
The factory assembled cable connectors are universally stamped P191/P192 IN, P191/P192 OUT, J101/J201, J102/ J202, J103/J203, J104/J204. For ease of installation erase or cover that part of the label that is not relevant before mating to its associated connector. For example some relevant labeling would be:

a. P191 IN, P191 OUT, J101, J102, J103, J104

b. P192 IN, P192 OUT, J201, J202, J203, J204

Step 2: Tie the cables in the duct space wherever appropriate.

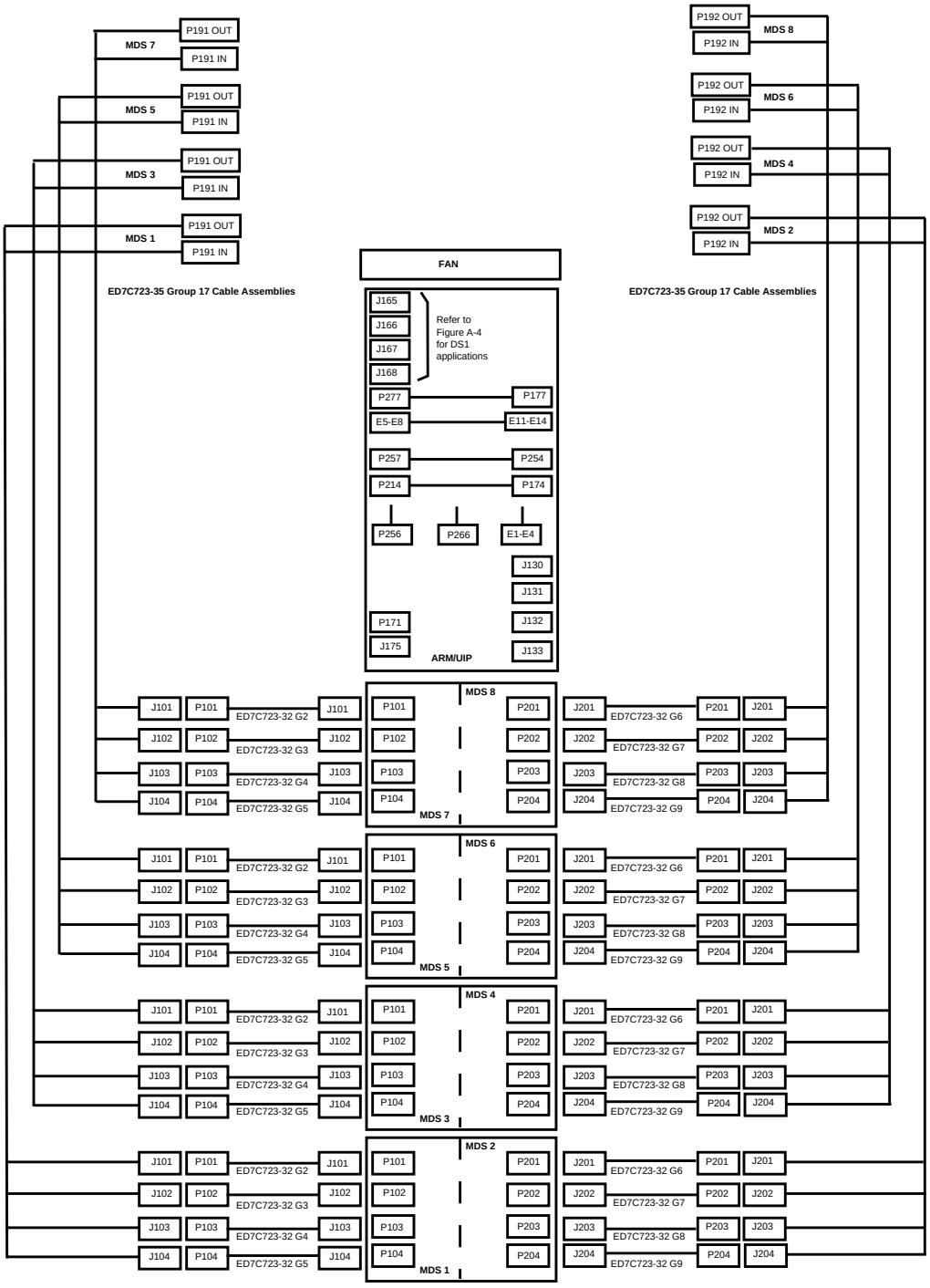


Figure 3-22. RT Bay Transmission Cable Assemblies for MDS/DSX-1 Application

Customer Interface Cable Connections

The following sections detail each installer operation necessary to interconnect the Customer Interface Cables. For ease of installation and to alleviate cable duct congestion these procedures should be followed in the sequence presented. Details of these procedures are outlined in the respective sections.

Sections	Description of Operations
Customer's Power and Ringing	Connect customer's DC power and Ringing Supplies to the Power Interface Unit.
Miscellaneous Discrete Alarms	Install Miscellaneous Discrete Alarm Customer Interface Cable (ED7C723-35 Group 1 or 2 or 3).
DS1	Install Optional DS1 Distribution/Feeder Cables (ED7C723-35 Group 4 or 5 or 6).
VF	Install VF Customer Interface Cables (ED7C723-35 Group 1 or 2 or 3) and mate to their associated MDS shelf dangler cable connectors.
E&M	Install E&M Customer Interface Cables (ED7C723-35 Group 1 or 2 or 3) and mate to their associated MDS shelf dangler cable connectors.
Fiber	Install fiber optic cables to the ARM and HDOS shelves.
RT Input Alarms	Install the Office Alarm Customer Interface Cable (ED7C723-35 Group 8) and mate its connector to the associated Bay Cable Assembly connector.
DSX-1 Metallic Feeder	Install the DSX-1 Interface Cable (ED7C723-35 Groups 19 through 22) and mate its connector to the associated MDS/ DSX-1 Interface Cable connector (ED7C723-35 Group 17). Install the DSX-1 Transmission Interface Cable (ED7C723-35 Groups 18) and mate its connector to the associated HDOS shelf connector.
DC Test Path Interfaces	Install the DC Test Pair Customer Interface Cable (ED7C723-35 Group 7) and mate its connector to the associated TAP cable connector.
External Test Head Interconnections	Install common cable assemblies (ED7C723-30 Group 17, 18; ED7C723-34 Group 13, 14; ED7C723-35 Group1, 2, or 3) and mate their connectors to the associated ARM and MDS cable connectors. Install and connect *4TEL RMU* and/or Reliance INTS and LTF cables (ED7C723-34 Group 9, 10, 11, 13, 14, 15, 16, 17; -35 Group1, 2, or 3; 846823763; VA02706-XX).

* *4TEL* and *RMU* are registered trademarks of Teradyne, Inc.

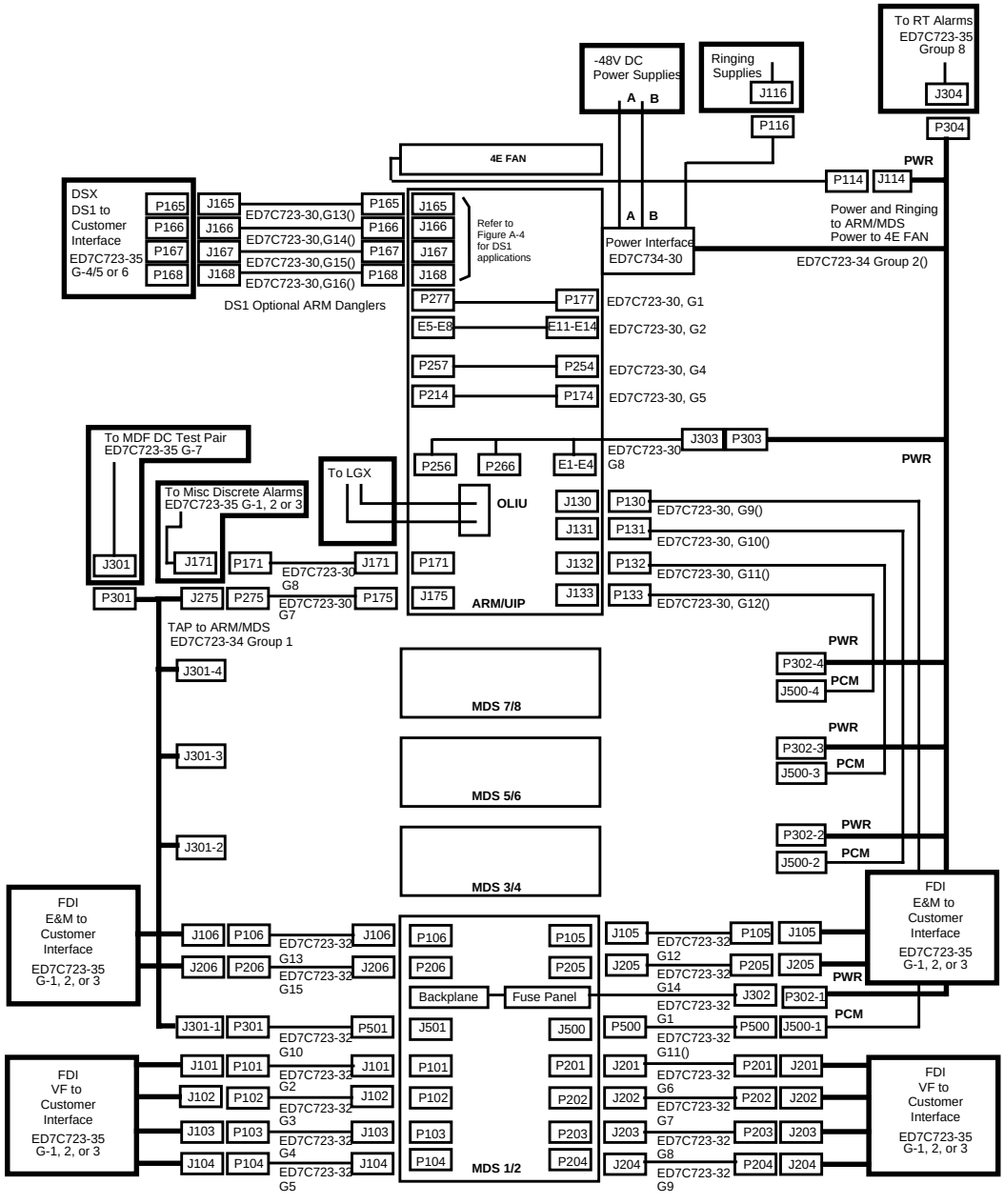


Figure 3-23A. Customer Interface Cables (Metallic Application)

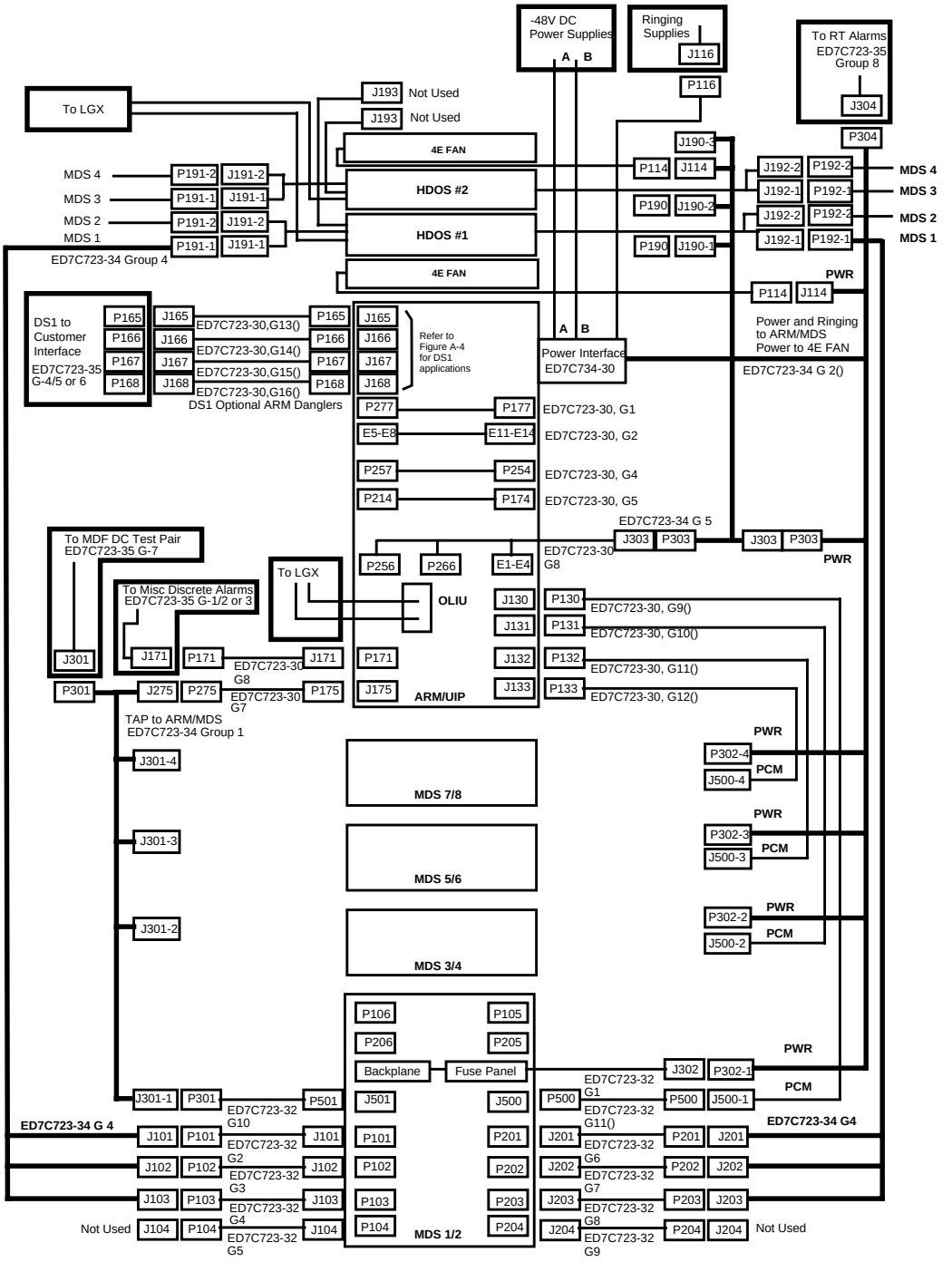


Figure 3-23B. Customer Interface Cables (Fiber Application)

External DC Power and Ringing Supply Connections

General

NOTE:
External DC power and ringing connections from the customer's supplies must be made to the *SLC*-2000 RT Bay Power Interface Unit (ED7C723-30). Power and ringing are not provided within the RT Bay.

NOTE:
Each power input (separate A and B feeders) lead and its associated return must not exceed the maximum wire size of 10 gauge at the PIU. Each -48 volt feeder should be protected with a 30 amp circuit breaker.

NOTE:
An external ringing supply such as the J1C182BC Ringing Supply Shelf must be provided for connections to the RT Bay. Both positive and negative 20 Hz ringing current generators should be equipped. The interconnecting cable should be a twisted triple (20-24 gauge) for each of the two ringing generators furnished. When interconnecting with the J1C182BC shelf the ED7C723-35 Group 9 Cable Assembly should be utilized.

NOTE:
The Power Interface Unit employs screw down terminals for connecting the ancillary cables. Do not attempt to connect wires larger than the capacity (10 gauge) of these terminals. Remove the unit's side panel for easier access.

NOTE:
Ensure that no *SLC*-2000 circuit packs are in place.

DC Power Connections

Step 1: Connect the office battery -48v and return leads as follows:

-48v A	terminal 1
-48v A RTN	terminal 2
-48v B	terminal 3
-48v B RTN	terminal 4

Ringing Connections

Step 1: Connect the office ringing supplies to the PIU TS1 terminals as follows

Table 3-3. PIU/J1C182BC Ringing Supply Shelf Terminal Assignment

Power Interface Unit		Ringing Supply*	
Designation	**TS1**	**P116**	**Color****
20Hz A RTN	terminal 5	2	black
+20Hz A	terminal 6	3	white
-20Hz A	terminal 7	1	red
20Hz B RTN	terminal 8	5	black
+20Hz B	terminal 9	6	white
-20Hz B	terminal 10	4	red

* Refer to APPLICATIONS chapter for ringing supply interconnections.

** ED7C723-35, G9 cable assembly color codes for J1C182BC Ringing Supply Shelf

Tests

Step 1: Verify continuity of all installed connections to the customer's power plant and ringing supply.

Step 2: Verify absence of any shorts between the RTN terminals and the -48v or 20 Hz terminals of the Power Interface Unit.

Step 3: Turn on BDFB circuit breakers and install or power up the associate ringing supplies temporarily.

Step 4: Verify the presence of -48v dc and ringing voltage at the PIU.

Requirement:

-42 to -56 volts approx. 105 volts ac

Step 5: Verify the presence of -48v dc at the ARM/UIP -48v (A)/-48v RTN and -48v (B)/-48v RTN jacks.

Requirement:

-42 to -56 volts dc

Step 6: Turn off the BDFB breakers and disconnect the two ringing supply sources.

Miscellaneous Discrete Environment Alarms and Controls

General

NOTE:
This procedure consists of installing the Miscellaneous Discrete Alarm Customer Interface Cable Assembly (ED7C723-35 Group 1 or 2 or 3) and mating its connector to the ARM Shelf Dangler Cable Assembly (ED7C723-30 Group 8) which has been furnished with the ARM shelf.

NOTE:
Some pins on this 50 pin connector are not assigned. The rest are brought out to MDF for cross-connections to miscellaneous alarms and telemetry systems.

NOTE:
Fourteen miscellaneous discrete inputs requiring active closures to ground can be used to detect and report various environmental alarm conditions such as open door, high humidity, low fuel, etc. Four control points are provided to control equipment (pumps, generators, etc.). When activated the control points provide a contact closure between the control point output and ground (output common - TLMOC). The TLMO leads must be grounded even if the control outputs are not used. Refer to the APPLICATIONS chapter for details.

NOTE:
This cable is available in varying lengths (Group 1, 2 and 3), however any excess may be cut off to relieve cable rack congestion.

Connections for ED7C723-35 Group 1, 2, or 3

Step 1: Install the appropriate Group Interface Cable Assembly in the left duct and mate its J171 connector with the P171 connector of the ARM Cable Assembly (ED7C723-30 Group 8).

Step 2: Terminate the pairs at the MDF and label the leads in accordance with Figure 3-24.

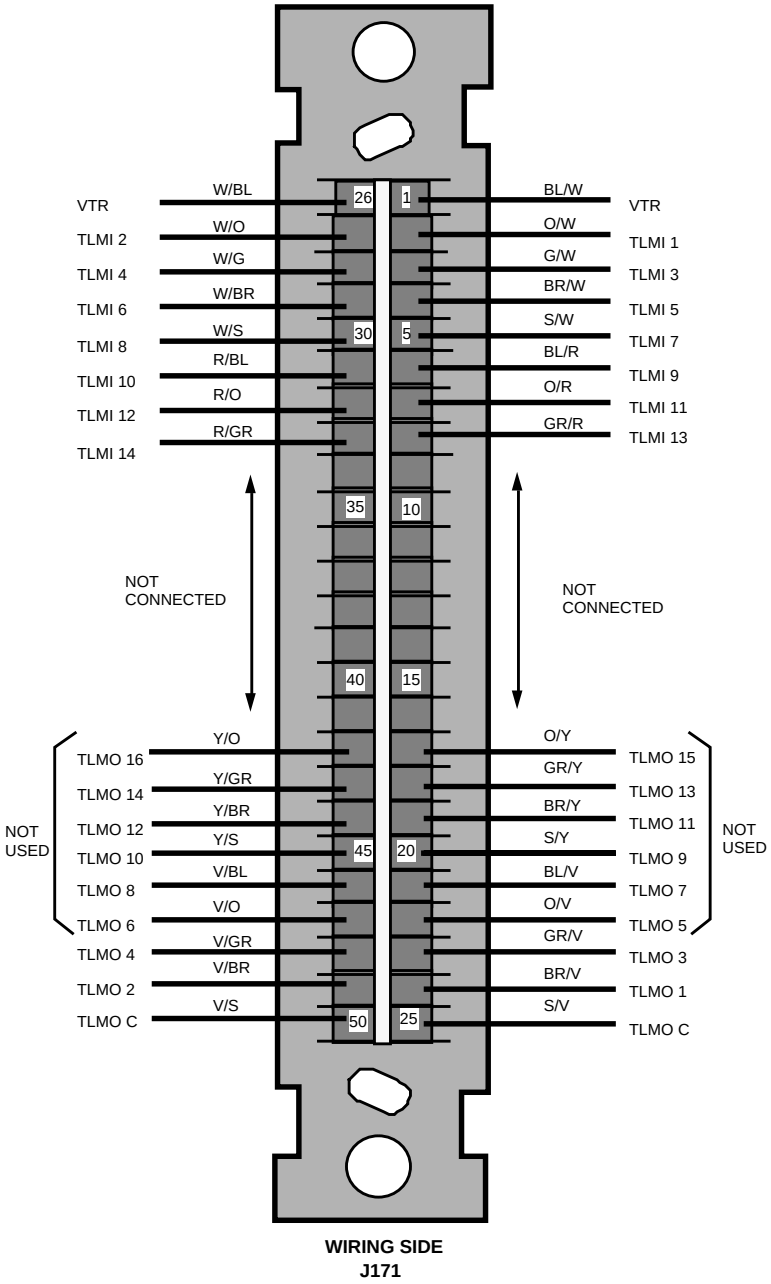


Figure 3-24. Discrete Alarm Connections

DS1 Connections

General

NOTE:
Up to 28 optional DS1 connections can be made from the ARM shelf to the office DSX for cross connections to customer DS1s.

To meet FCC EMC requirements it is required that there be a minimum of 30 feet of cable between the DSX and the *SLC*-2000 ARM shelf DS1 output.

The maximum cable length to the DSX is 450 feet using 26 gauge wire (ED7C723-35 Group 6) and 655 feet using 24 gauge wire.

NOTE:
Transmit (OUT) and Receive (IN) directions are run in separate cables to the DSX. The cable shields shall not be grounded at the DSX and the Transmit and Receive cables shall not be mixed on the same cross-connect block.

NOTE:
DS1 Distribution (connectors J165-J168 on the ARM shelf backplane) is associated with the “C” SONET multiplexer group and the DS1 (LS-C) circuit pack slots.

NOTE:
DS1 Feeder interface (connectors J160-J163 on the ARM shelf backplane) is associated with the “A” SONET multiplexer group and the LIU (LS-A) circuit pack slots.

NOTE:
The *SLC*-2000 System supports either DS1 Distribution or DS1 Feeder, but not both simultaneously. The same cable assemblies (ED7C723-35 Groups 4 to 6) are utilized for either the A or C SONET multiplexer function group and can be moved to the associated connectors on the ARM backplane for their appropriate application.

Installation Procedure for Cable Assemblies ED7C723-35 Groups 4, 5 or 6

NOTE:
This procedure consists of installing the DS1 Customer Interface Cable Assemblies (ED7C723-35 Group 4 or 5 or 6, Figure 3-25) and mating their connectors to the ARM Shelf Dangler Cable Assemblies [ED7C723-30 Groups 13() to 16()] which have been previously installed.

NOTE:
Some pins on this 37 pin connector are not assigned; the rest are brought out to DSX for cross connections to customer DS1s.

NOTE:
This cable is available in varying lengths (Group 4, 5 and 6), however any excess may be cut off to relieve cable rack congestion.

NOTE:
The cable shields are grounded at the ARM shelf through the cable connector hoods. The cable connector hoods must be screwed down to the mating ARM shelf connectors with the hood captive screws. Do not ground the cable shields at the DSX.

Connections

Step 1: Install the DS1 Interface Cable Assemblies in the left duct and mate their connectors (P160 to P163 or P165 to P168) with the J160 to J163 or J165 to J168 connectors of the ARM Cable Assemblies [ED7C723-30 Groups13() to 16()]; consult Figure 3-25.

Step 2: Terminate the transmit pairs (DS1 OUT) at the DSX and label the leads in accordance with the Figures 3-28 and 3-29.

Step 3: Terminate the receive pairs (DS1 IN) at the DSX and label the leads in accordance with the Figures 3-26 and 3-27.

Step 4: Stamp the connectors with their associated P160-P163 or P165-P168 designations.

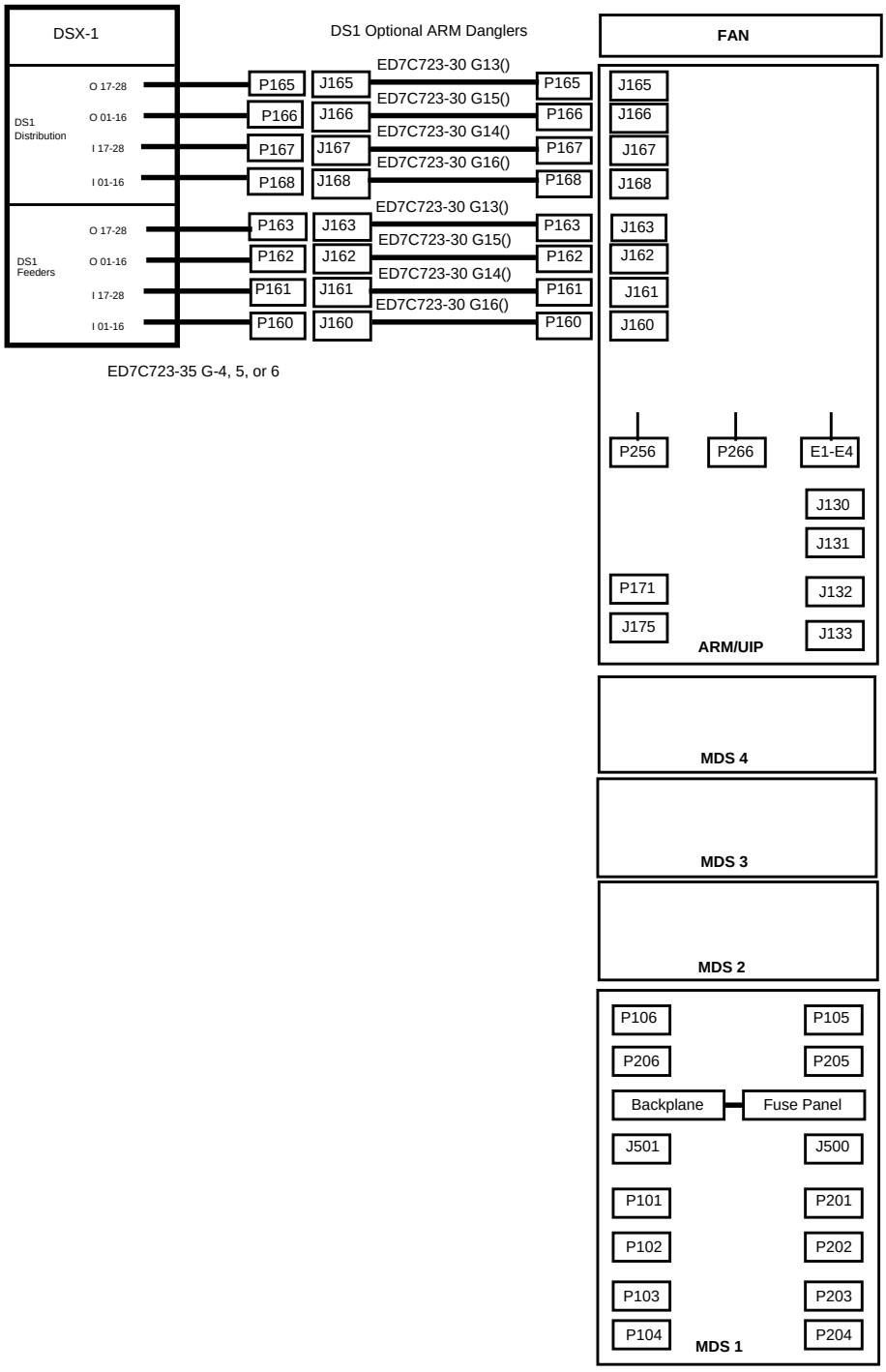


Figure 3-25. Customer DS1 Interface Cables (ED7C723-35, G4, 5, or 6)

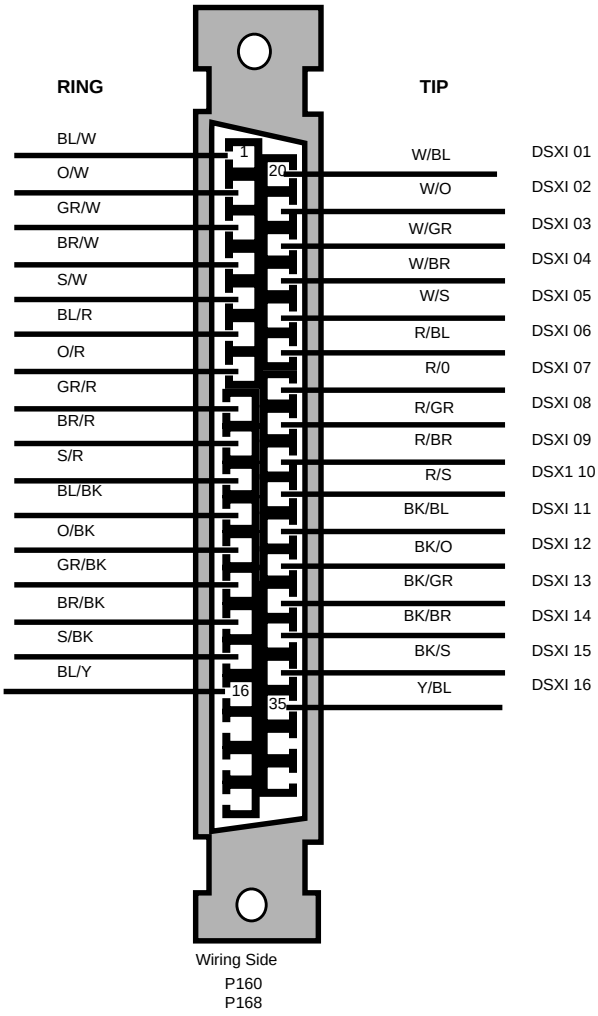


Figure 3-26. DS1 IN (1 - 16) Connections

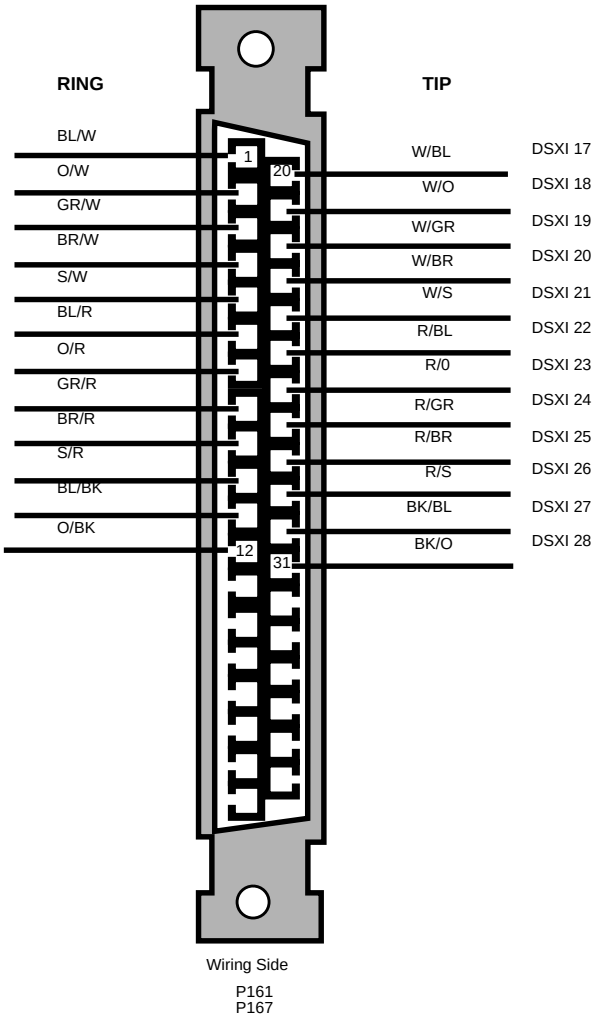


Figure 3-27. DS1 IN (17 - 28) Connections

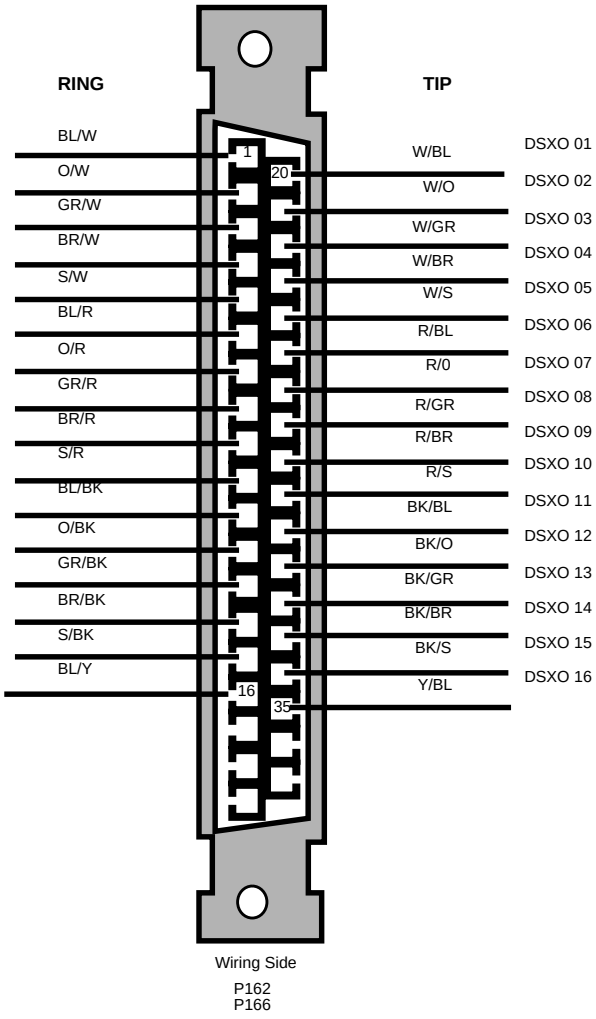


Figure 3-28. DS1 OUT (1 - 16) Connections

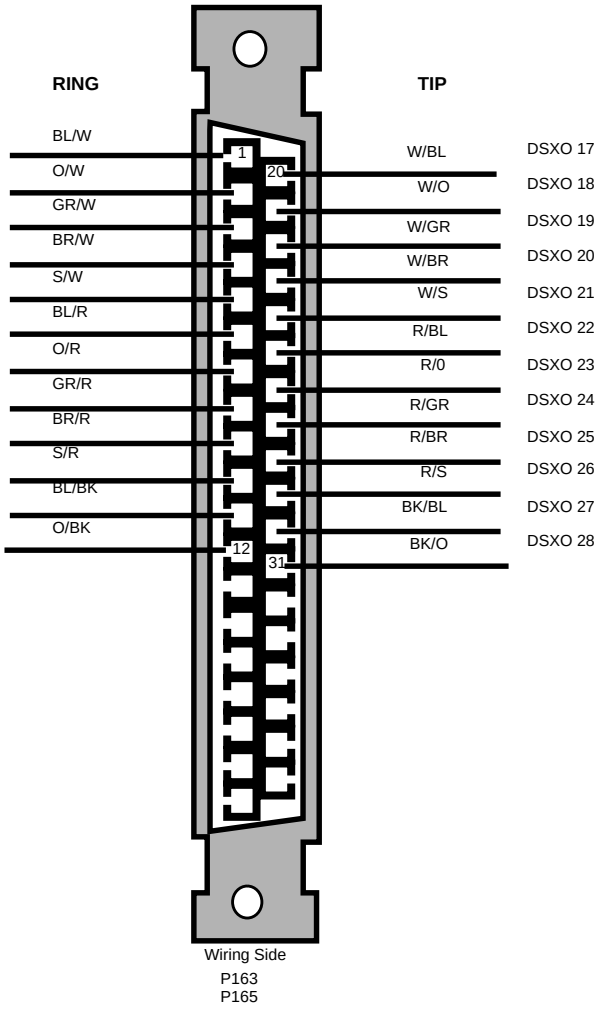


Figure 3-29. DS1 OUT (17 - 28) Connections

VF Connections

Installation Procedure for Cable Assemblies ED7C723-35 Groups 1, 2 or 3

NOTE:
This procedure consists of installing the VF Customer Interface Cable Assemblies (ED7C723-35 Group 1, 2, or 3) and mating their connectors to the MDS Shelf Dangler Cable Assemblies (ED7C723-32 Groups 2 to 9, Figures 3-30 and 3-31) which have been furnished as part of the MDS assembly.

NOTE:
Some pins on this 50 pin connector are not assigned. The rest are brought out to the MDF for cross connections to subscriber derived pairs.

NOTE:
This cable is available in varying lengths (Group 1, 2 and 3), however any excess may be cut off to relieve cable rack congestion.

NOTE:
VF channel numbering is from 1 to 96 for each MDS shelf. There are two shelves per MDS Assembly (J1C265AB-1) with a total of eight shelves (4 assemblies) per 7 foot RT Bay (maximum of 768 quad channels). Each shelf supports 96 channels with channel unit slots numbered CU1 to CU24.

NOTE:
System ID labels (furnished with the MDS Assembly) shall be filled out by the customer in accordance with the route/system numbering scheme. The MDF circuit labeling should follow this numbering pattern. Refer to the APPLICATIONS chapter for typical cross-connect block numbering.

NOTE:
For the installation of HDOS interconnecting cable assemblies, ED7C723-34 Group 6, refer to the HDOS Connections section.

NOTE:
For the installation of MDS/DSX-1 interconnecting cable assemblies, ED7C723-35 Group 17, refer to the DSX-1 Connections section.

Connections

Step 1: Install the VF Interface Cable Assemblies in the appropriate duct and mate their connectors with the connectors of the MDS Cable Assemblies in accordance with Figures 3-30 and 3-31 and the table below:

Table 3-4. VF Connections

Left Cable Duct	Right Cable Duct
J101 to P101	J201 to P201
J102 to P102	J202 to P202
J103 to P103	J203 to P203
J104 to P104	J204 to P204

NOTE:
Stamp each connector (J101 to J204) before mating to its associated connector.

Step 2: Terminate the VF pairs at the MDF and label the cables, connectors, and the conductors in accordance with the figures for the J101 to J104 and J201 to J204 connectors. Note the wire color coding sequence of the factory prepared cable assemblies to facilitate the terminations.

Table 3-5. VF Channel Number Identification

Left Cable Duct	Figure	Right Cable Duct	Figure
J101 to P101	3-32	J201 to P201	3-36
J102 to P102	3-33	J202 to P202	3-37
J103 to P103	3-34	J203 to P203	3-38
J104 to P104	3-35	J204 to P204	3-39

Step 3: Orient the mating cable connectors so that the customer cables exit upwards towards the cable racks. Refer to Figure 3-31.

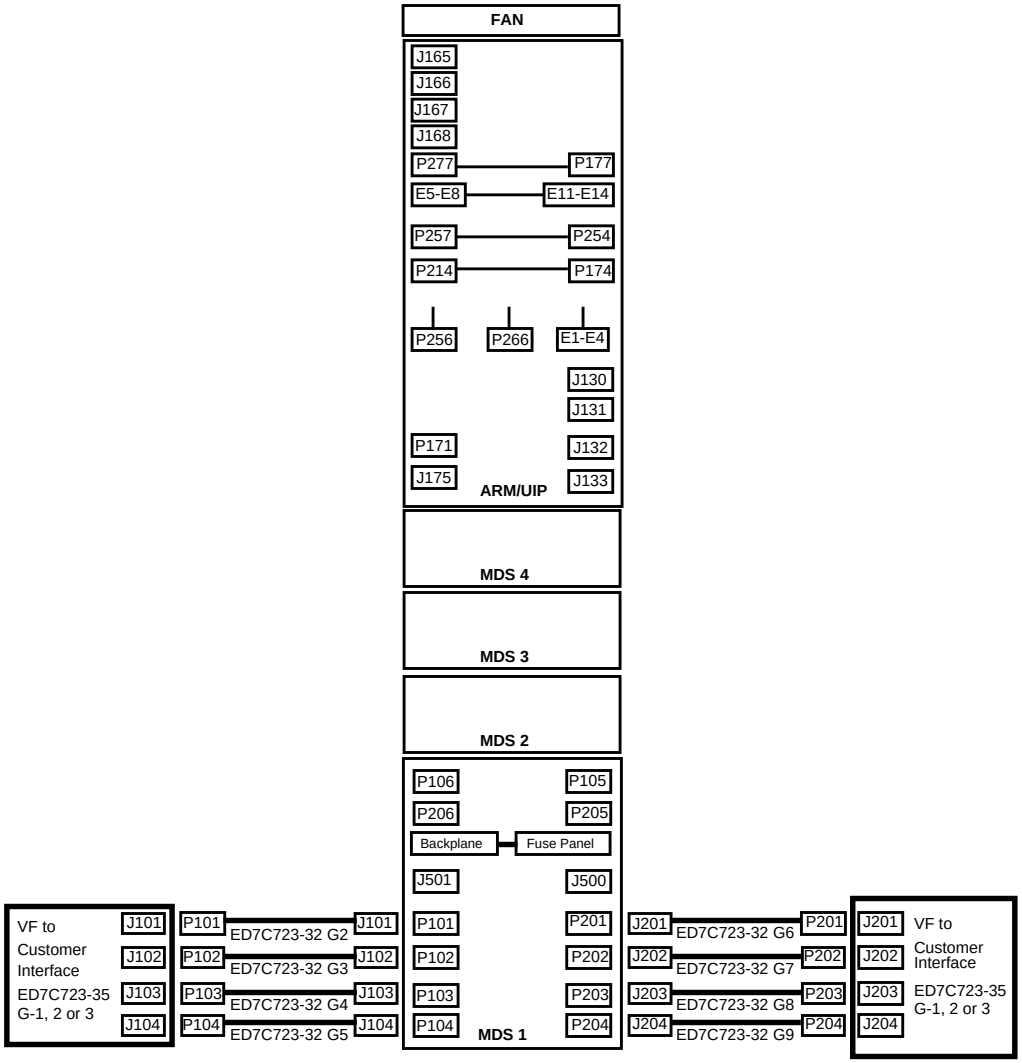


Figure 3-30. VF Bay Interface Cables

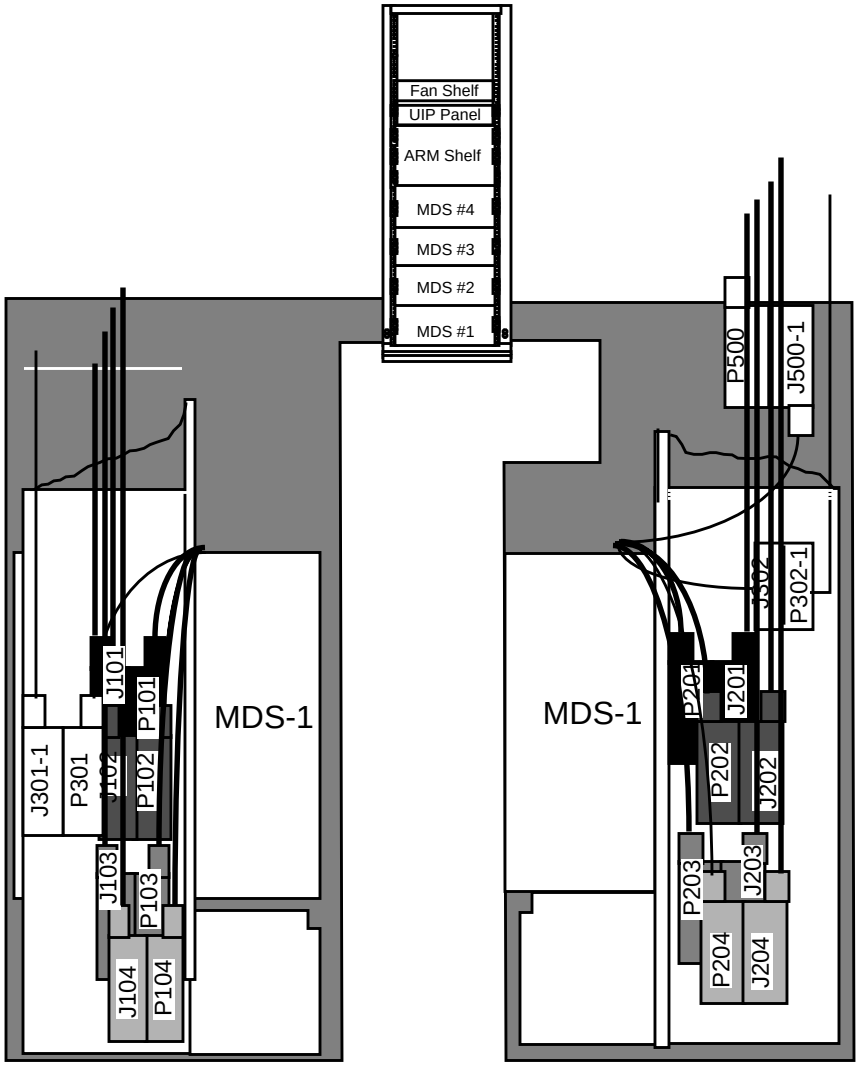
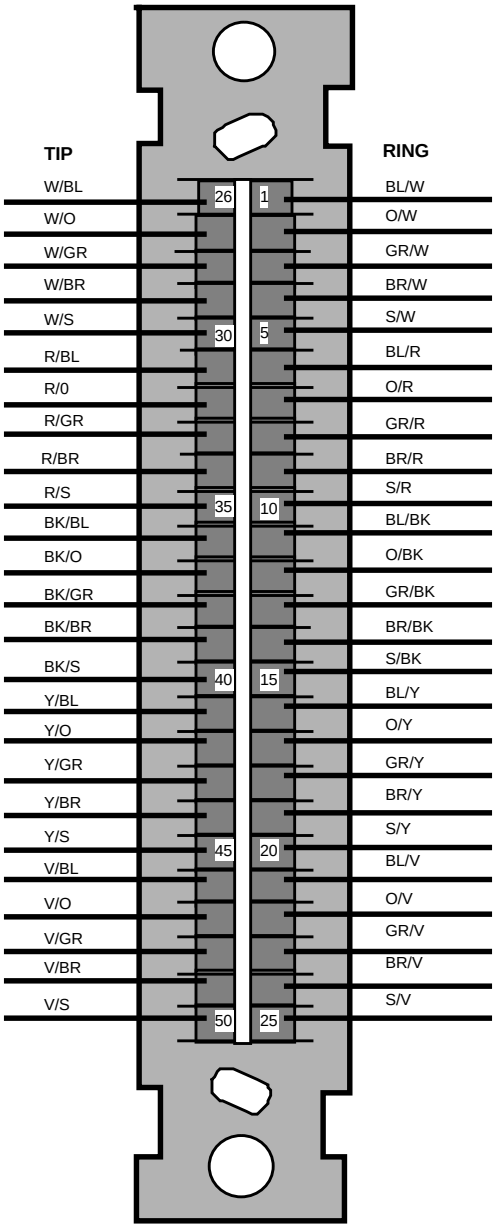


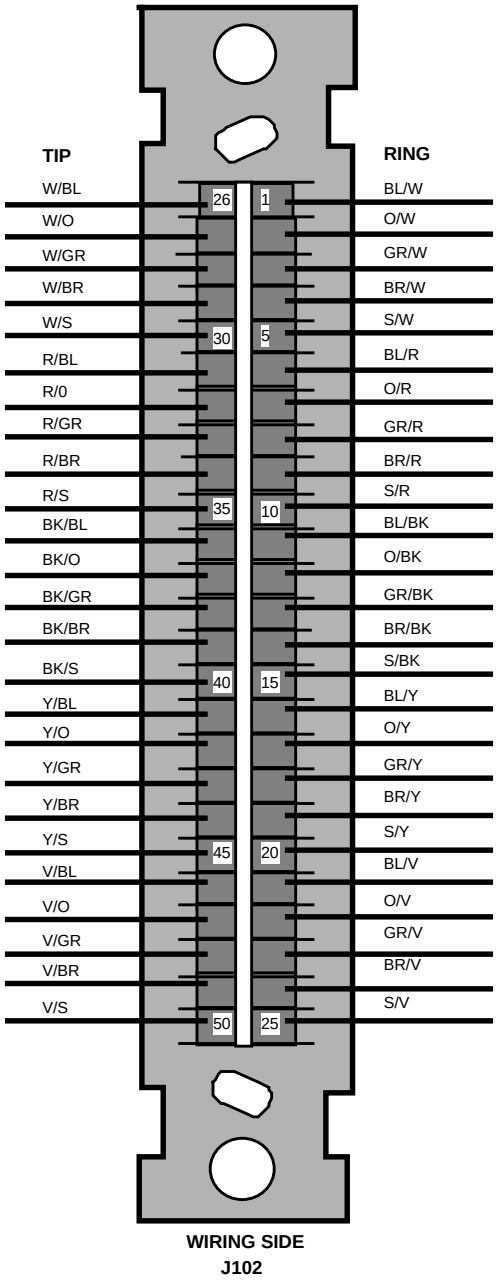
Figure 3-31. MDS-1 VF Cabling



Shelf 1, 3, 5, or 7

CH	CP Slot	Quad Unit/Ch
1	1/4	1/1
2		1/2
3		1/3
4		1/4
5	5/8	2/1
6		2/2
7		2/3
8		2/4
9	9/12	3/1
10		3/2
11		3/3
12		3/4
13	13/16	4/1
14		4/2
15		4/3
16		4/4
17	17/20	5/1
18		5/2
19		5/3
20		5/4
21	21/24	6/1
22		6/2
23		6/3
24		6/4
25	25/28	7/1

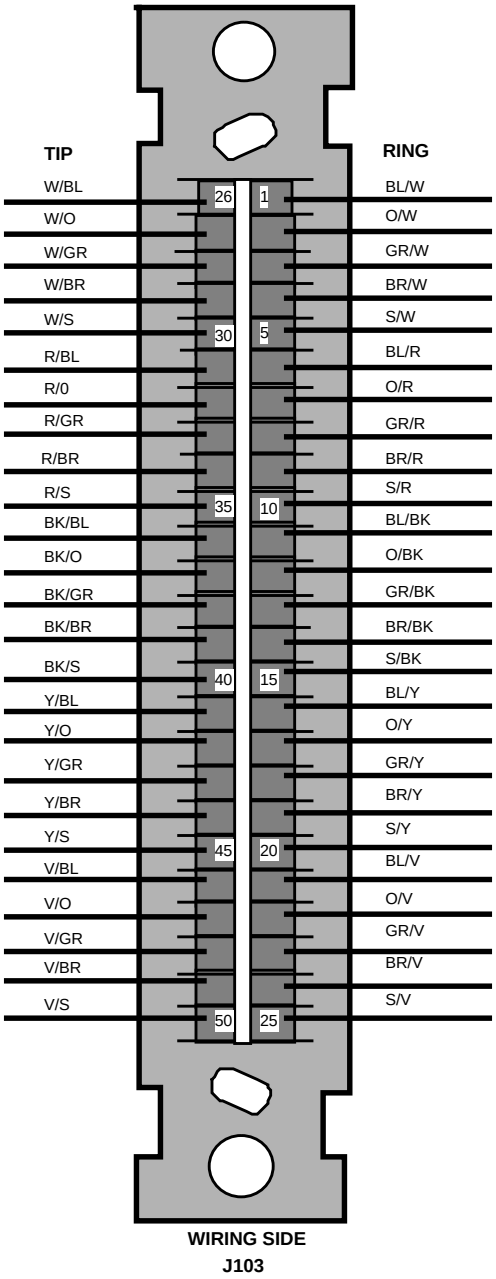
Figure 3-32. VF Connections J101 (Channels 1 - 25)



Shelf 1, 3, 5, or 7

CH	CP Slot	Quad Unit/Ch
26	25/28	7/2
27		7/3
28		7/4
29	29/32	8/1
30		8/2
31		8/3
32		8/4
33	33/36	9/1
34		9/2
35		9/3
36		9/4
37	37/40	10/1
38		10/2
39		10/3
40		10/4
41	41/44	11/1
42		11/2
43		11/3
44		11/4
45	45/48	12/1
46		12/2
47		12/3
48		12/4
49	49/52	13/1
50		13/2

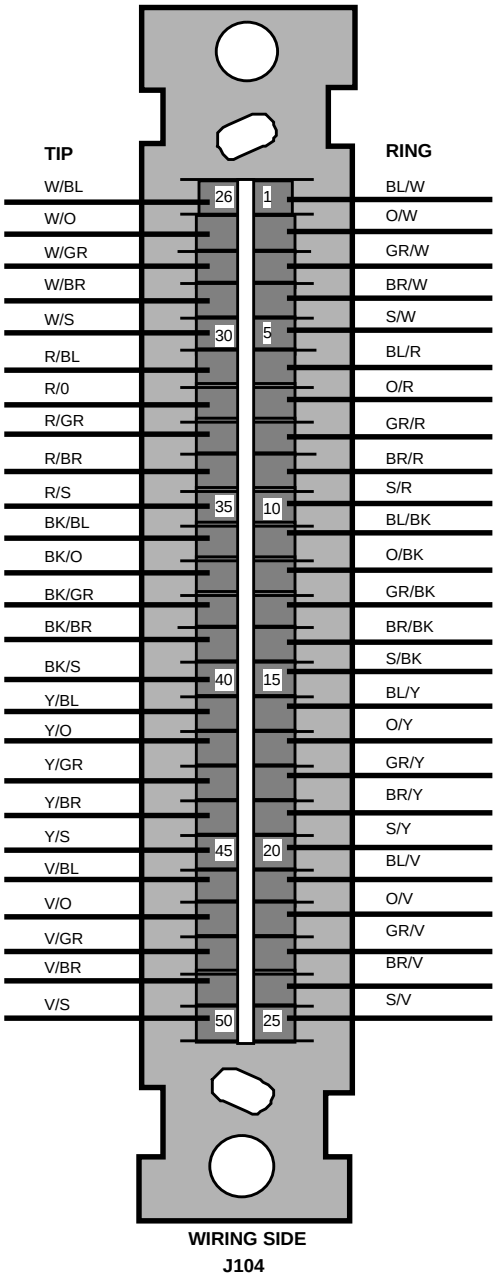
Figure 3-33. VF Connections J102 (Channels 26 - 50)



Shelf 1, 3, 5, or 7

CH	CP Slot	Quad Unit/Ch
51	49/52	13/3
52		13/4
53	53/56	14/1
54		14/2
55		14/3
56		14/4
57	57/60	15/1
58		15/2
59		15/3
60		15/4
61	61/64	16/1
62		16/2
63		16/3
64		16/4
65	65/68	17/1
66		17/2
67		17/3
68		17/4
69	69/72	18/1
70		18/2
71		18/3
72		18/4
73	73/76	19/1
74		19/2
75		19/3

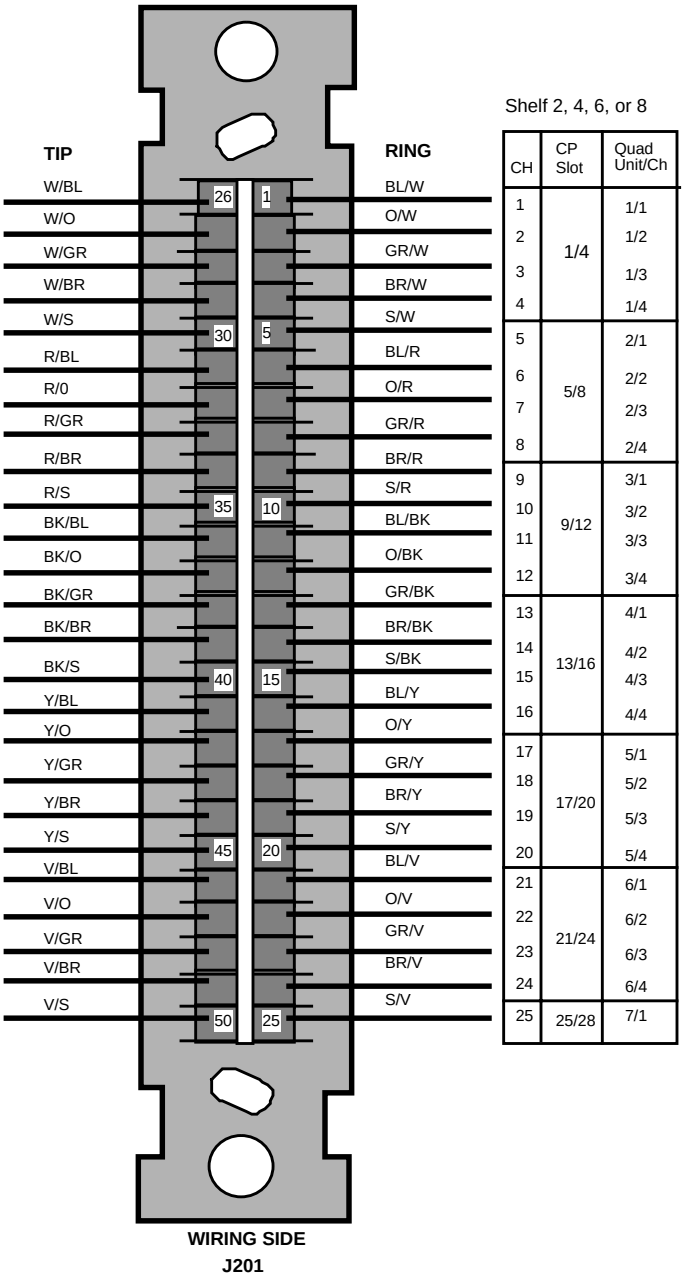
Figure 3-34. VF Connections J103 (Channels 51 - 75)



Shelf 1, 3, 5, or 7

CH	CP Slot	Quad Unit/Ch
76	73/76	19/4
77	77/80	20/1
78		20/2
79		20/3
80		20/4
81	81/84	21/1
82		21/2
83		21/3
84		21/4
85	85/88	22/1
86		22/2
87		22/3
88		22/4
89	89/92	23/1
90		23/2
91		23/3
92		23/4
93	93/96	24/1
94		24/2
95		24/3
96		24/4
UNASSIGNED		

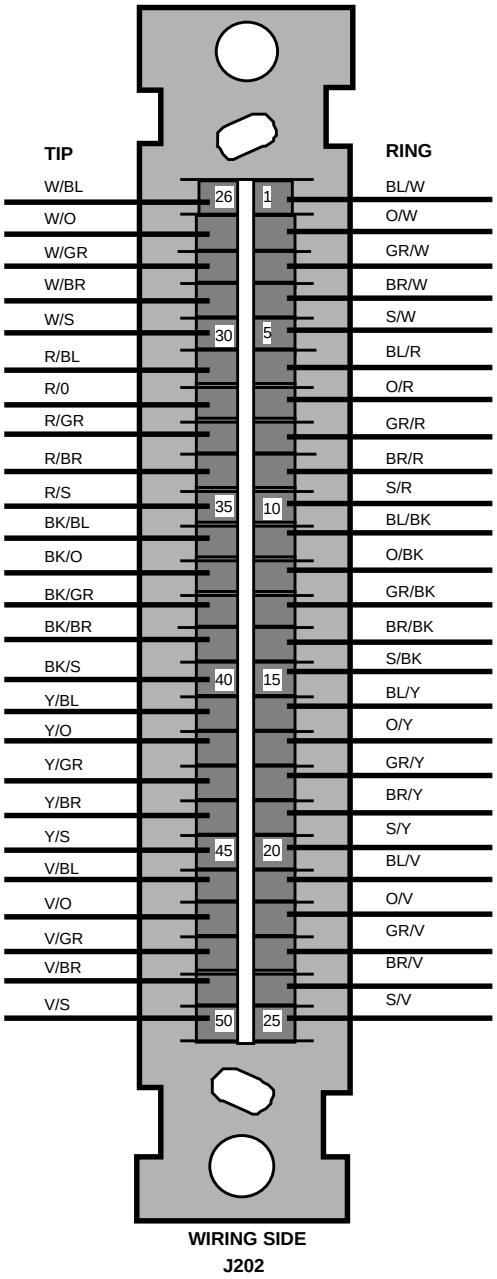
Figure 3-35. VF Connections J104 (Channels 76 - 96)



Shelf 2, 4, 6, or 8

CH	CP Slot	Quad Unit/Ch
1	1/4	1/1
2		1/2
3		1/3
4		1/4
5	5/8	2/1
6		2/2
7		2/3
8		2/4
9	9/12	3/1
10		3/2
11		3/3
12		3/4
13	13/16	4/1
14		4/2
15		4/3
16		4/4
17	17/20	5/1
18		5/2
19		5/3
20		5/4
21	21/24	6/1
22		6/2
23		6/3
24		6/4
25	25/28	7/1

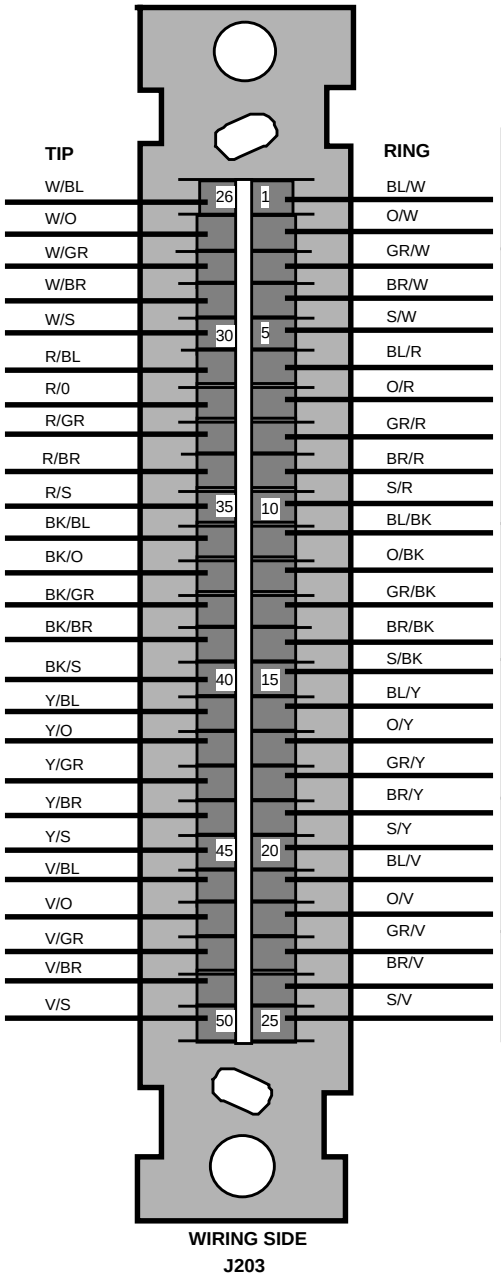
Figure 3-36. VF Connections J201 (Channels 1 - 25)



Shelf 2, 4, 6, or 8

CH	CP Slot	Quad Unit/Ch
26	25/28	7/2
27		7/3
28		7/4
29	29/32	8/1
30		8/2
31		8/3
32		8/4
33	33/36	9/1
34		9/2
35		9/3
36		9/4
37	37/40	10/1
38		10/2
39		10/3
40		10/4
41	41/44	11/1
42		11/2
43		11/3
44		11/4
45	45/48	12/1
46		12/2
47		12/3
48		12/4
49	49/52	13/1
50		13/2

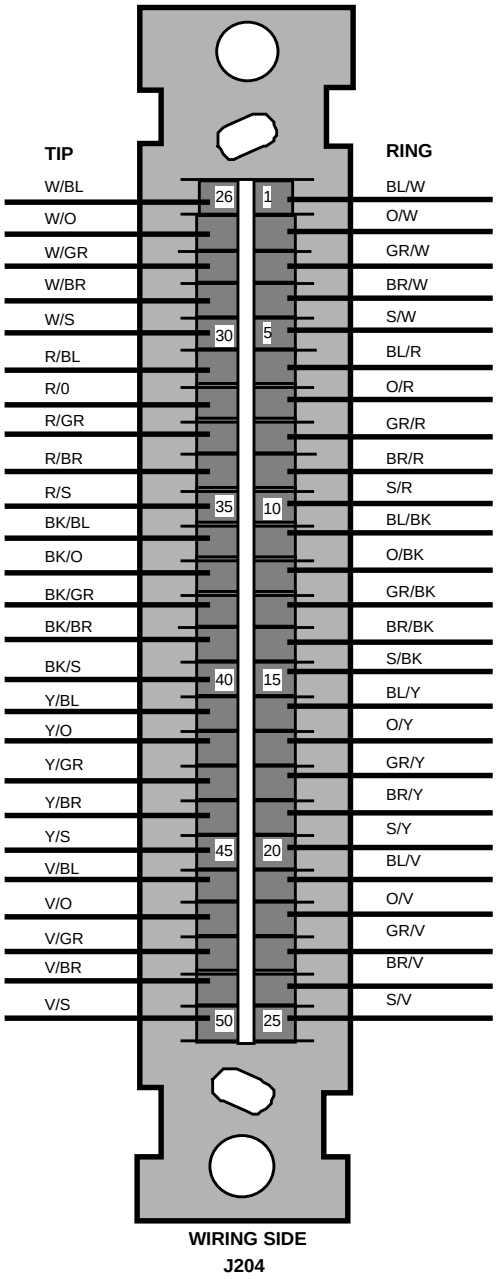
Figure 3-37. VF Connections J202 (Channels 26 - 50)



Shelf 2, 4, 6, or 8

CH	CP Slot	Quad Unit/Ch
51	49/52	13/3
52		13/4
53	53/56	14/1
54		14/2
55		14/3
56		14/4
57	57/60	15/1
58		15/2
59		15/3
60		15/4
61	61/64	16/1
62		16/2
63		16/3
64		16/4
65	65/68	17/1
66		17/2
67		17/3
68		17/4
69	69/72	18/1
70		18/2
71		18/3
72		18/4
73	73/76	19/1
74		19/2
75		19/3

Figure 3-38. VF Connections J203 (Channels 51 - 75)



Shelf 2, 4, 6, or 8

CH	CP Slot	Quad Unit/Ch
76	73/76	19/4
77	77/80	20/1
78		20/2
79		20/3
80		20/4
81	81/84	21/1
82		21/2
83		21/3
84		21/4
85	85/88	22/1
86		22/2
87		22/3
88		22/4
89	89/92	23/1
90		23/2
91		23/3
92		23/4
93	93/96	24/1
94		24/2
95		24/3
96		24/4
UNASSIGNED		

Figure 3-39. VF Connections J204 (Channels 76 - 96)

E&M Connections

Installation Procedure for Cable Assemblies ED7C723-35 Groups 1, 2 or 3

NOTE:
This procedure consists of installing the E&M Customer Interface Cable Assemblies (ED7C723-35 Group 1, 2, or 3) and mating their connectors to the MDS Shelf Dangler Cable Assemblies (ED7C723-32 Groups 12 to 15, Figures 3-40 and 3-41) which have been furnished as part of the MDS assembly.

NOTE:
Some pins on this 50 pin connector are not assigned. The rest are brought out to the MDF for cross connections to subscriber derived pairs.

NOTE:
This cable is available in varying lengths (Group 1, 2 and 3), however any excess may be cut off to relieve cable rack congestion.

NOTE:
VF channel numbering is from 1 to 96 for each MDS shelf. There are two shelves per MDS Assembly (J1C265AB-1) with a total of eight shelves (4 assemblies) per 7 foot RT Bay (maximum of 768 quad channels). Each shelf supports 96 channels with channel unit slots numbered CU1 to CU24.

NOTE:
System ID labels (furnished with the MDS Assembly) shall be filled out by the customer in accordance with the route/system numbering scheme. The MDF circuit labeling should follow this numbering pattern. Refer to the APPLICATIONS chapter for typical cross-connect block numbering.

Connections

Step 1: Install the VF Interface Cable Assemblies in the appropriate duct and mate their connectors with the connectors of the MDS Cable Assemblies in accordance with Figures 3-40 and 3-41 and the table below.

Table 3-6. E&M Connections

Left Cable Duct	Right Cable Duct
J106 to P106	J105 to P105
J206 to P206	J205 to P205

NOTE:
Stamp each connector (J105, J106, J205, J206) before mating to its associated connector.

Step 2: Terminate the E&M pairs at the MDF and label the cables, connectors, and the conductors in accordance with the figures for J105, J106, J205, and J206 connectors. Note the wire color coding sequence of the factory prepared cable assemblies to facilitate the terminations.

Table 3-7. E&M Channel Number Identification

Left Cable Duct	Figure	Right Cable Duct	Figure
J106	3-43	J105	3-42
J206	3-45	J205	3-44

Step 3: Orient the mating cable connectors so that the customer cables exit upwards towards the cable racks. Refer to Figure 3-41.

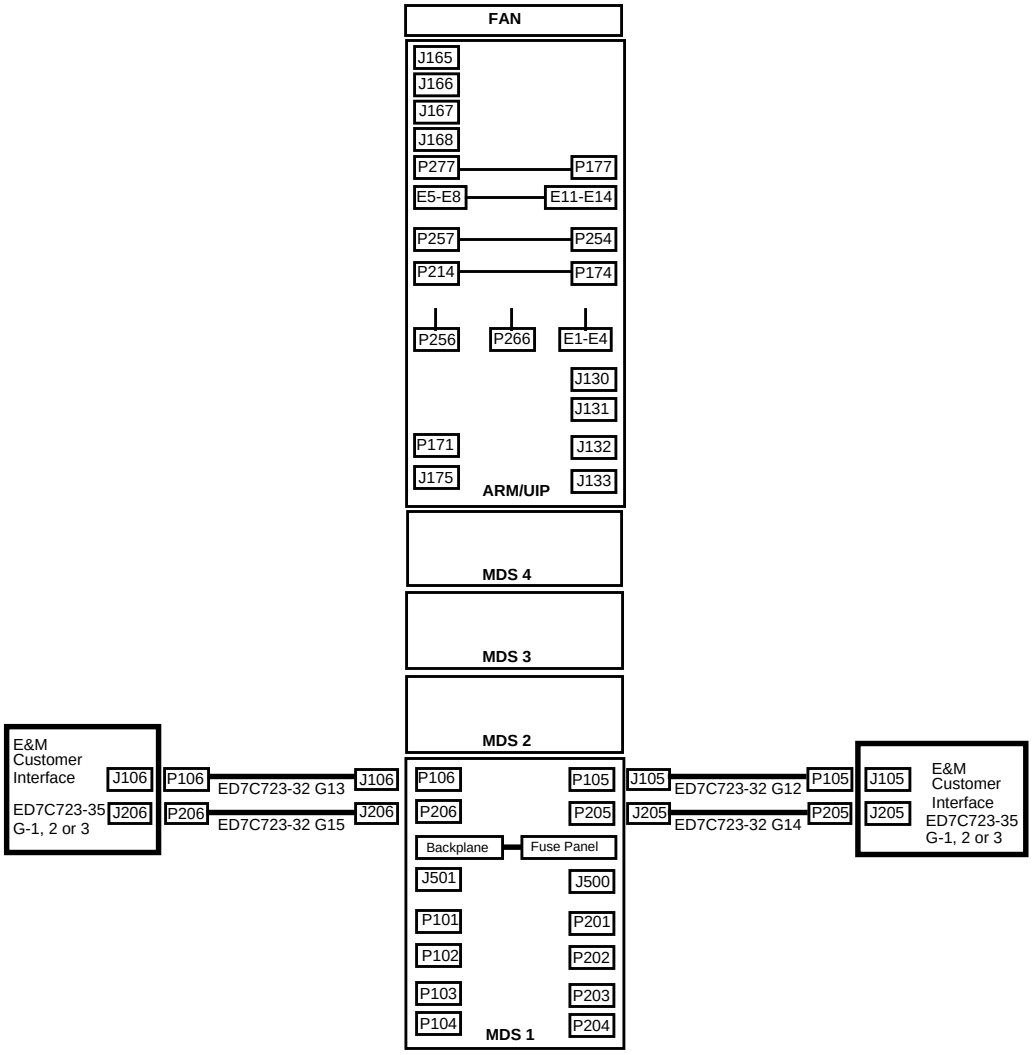


Figure 3-40. E&M Interface Cables

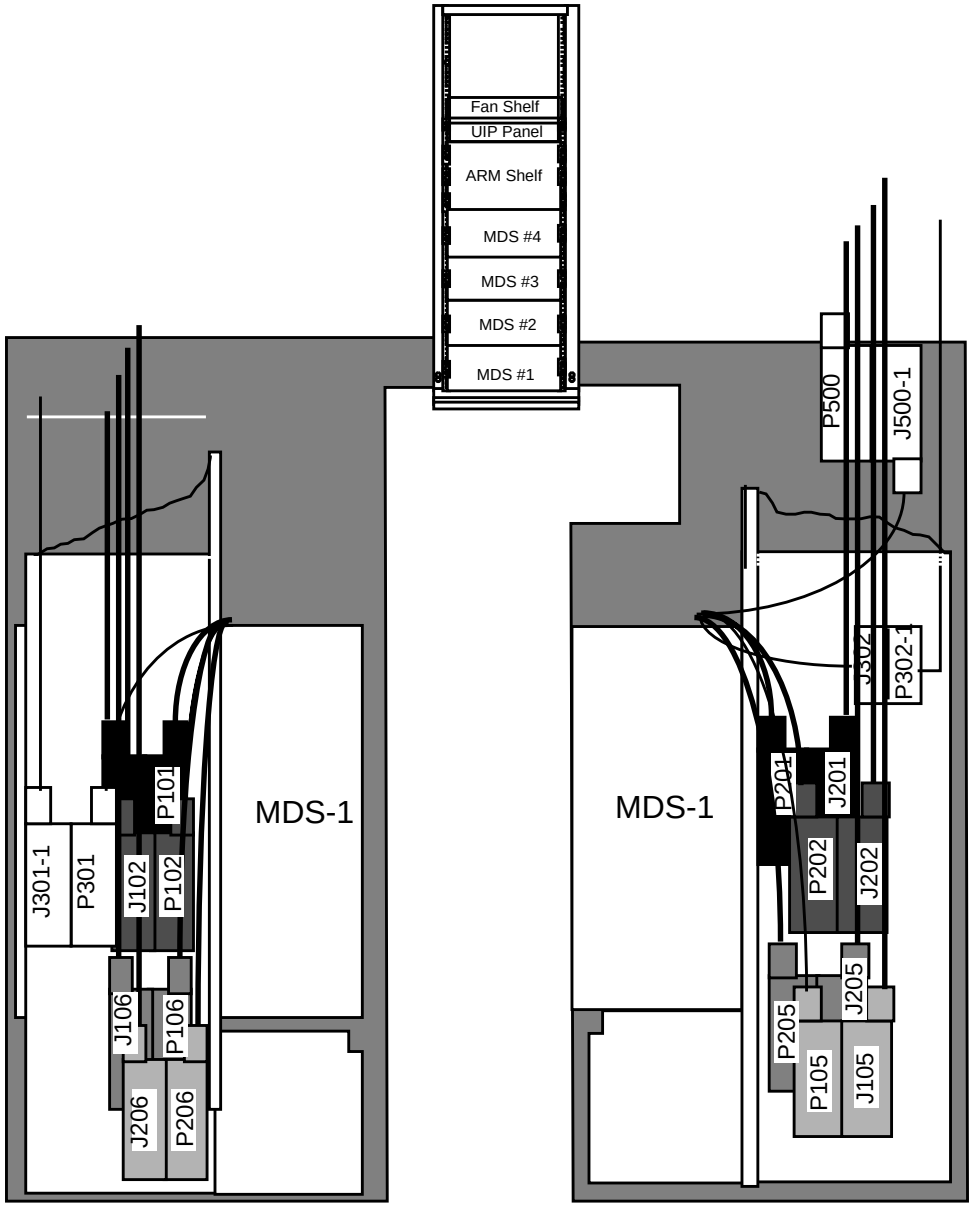


Figure 3-41. MDS-1 E&M Cabling

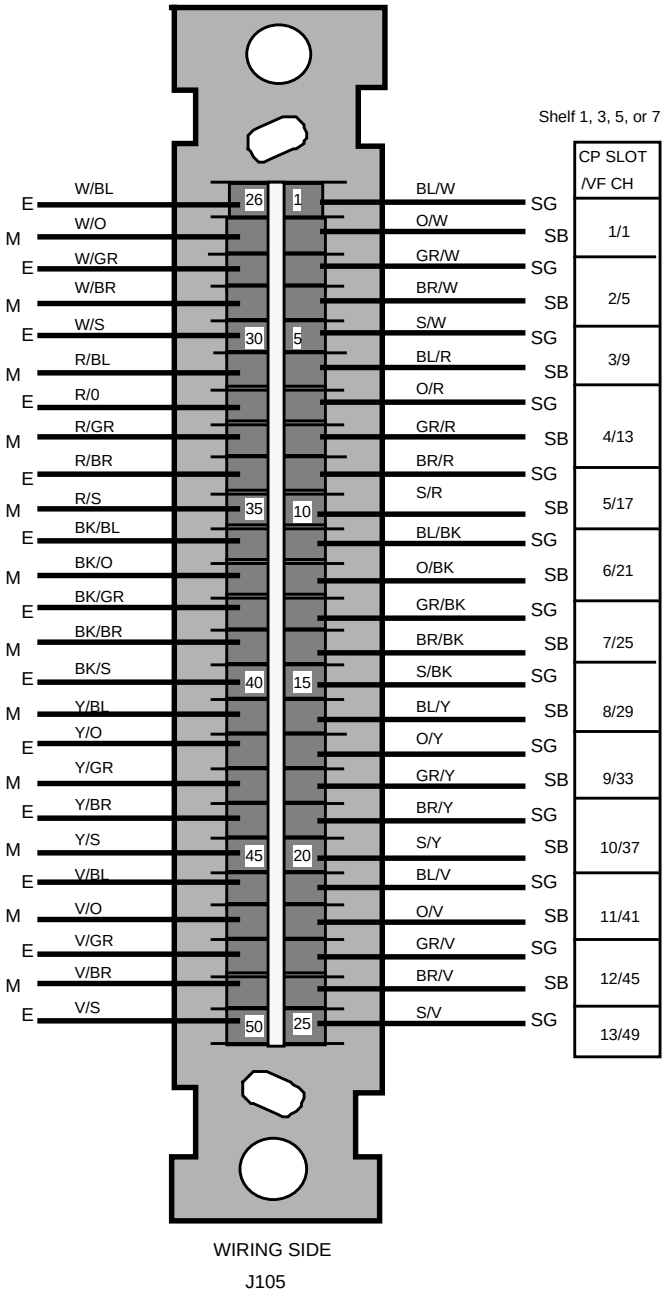


Figure 3-42. E&M Connections J105 (Channel Unit Slots 1 - 13)

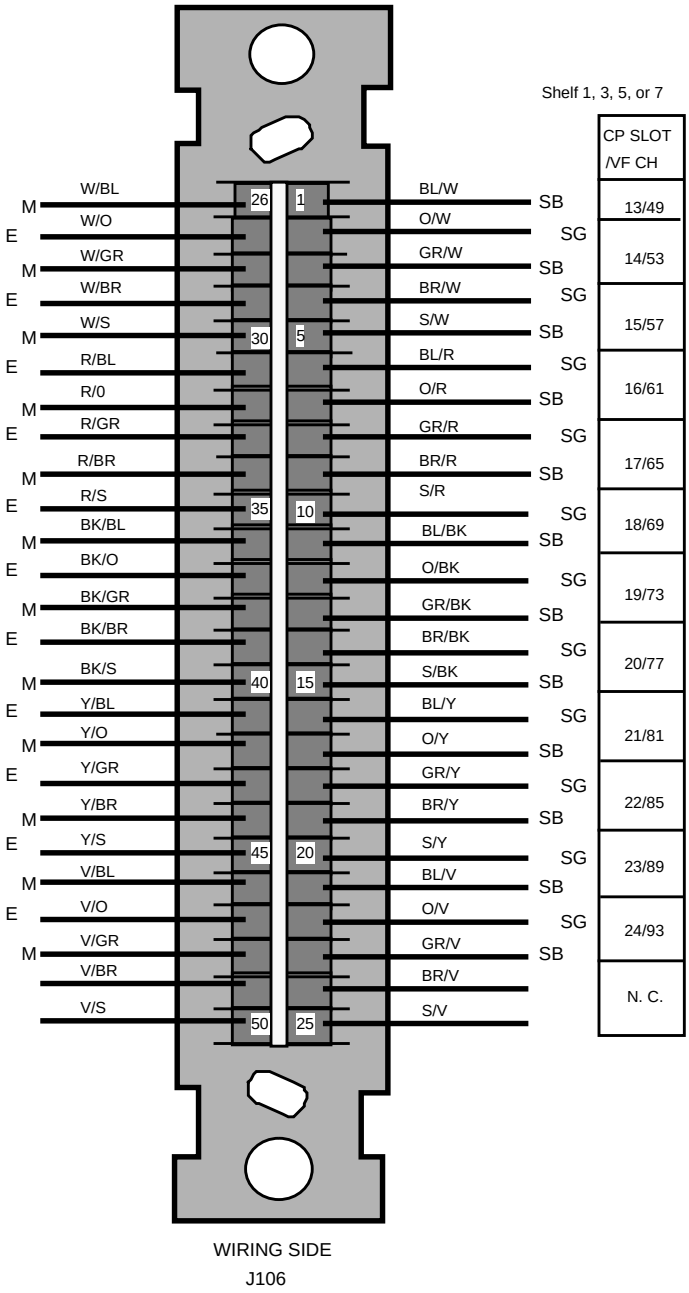


Figure 3-43. E&M Connections J106 (Channel Unit Slots 13 - 24)

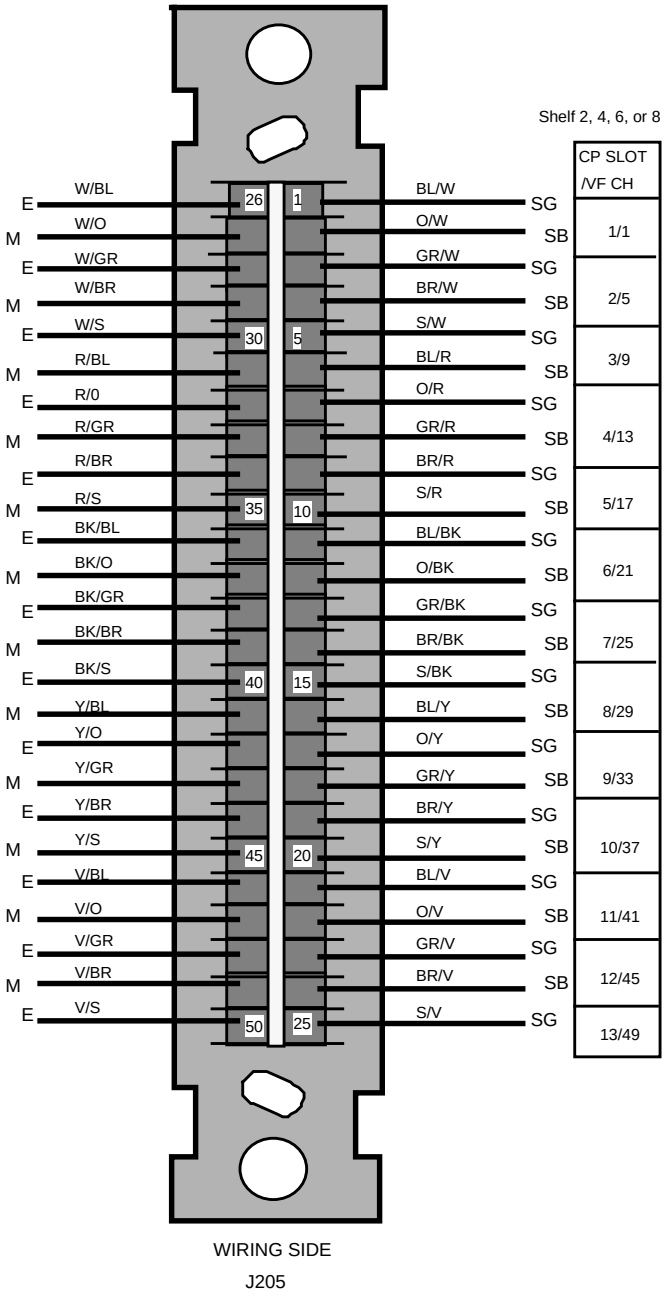


Figure 3-44. E&M Connections J205 (Channel Unit Slots 1 - 13)

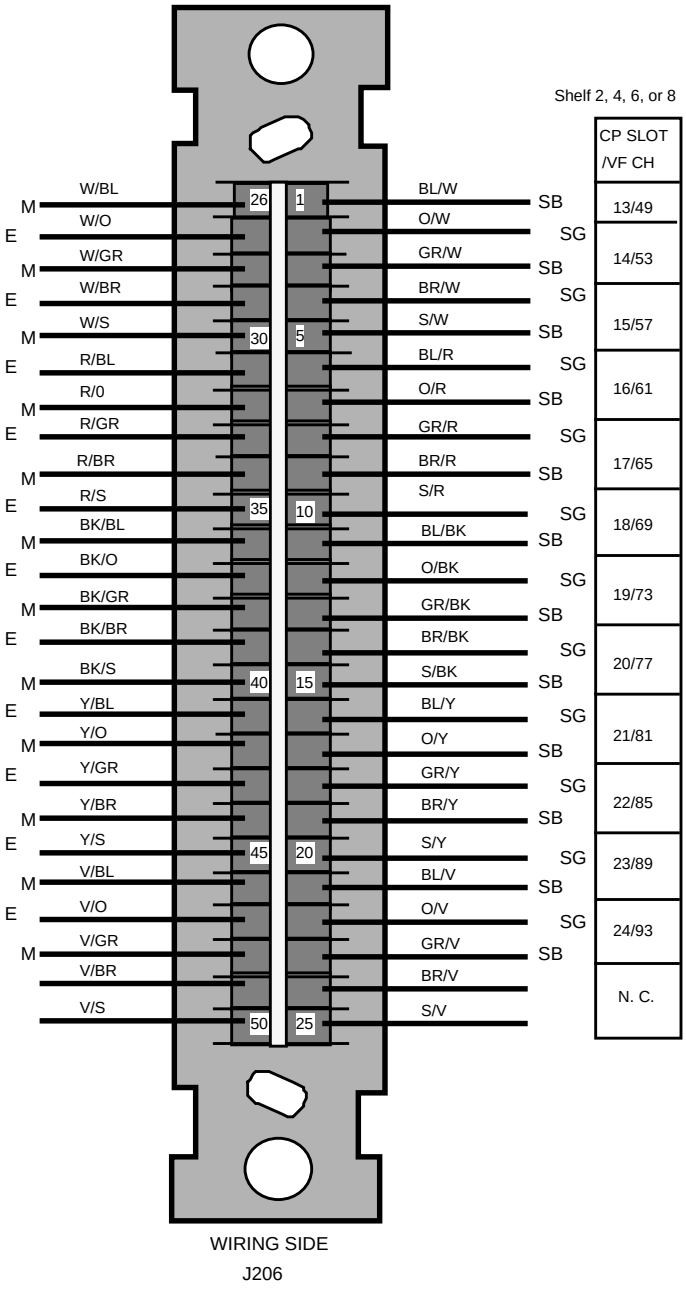


Figure 3-45. E&M Connections J206 (Channel Unit Slots 13 - 24)

ARM Shelf Fiber Optic Cables

General

Fiber jumpers must be single mode with ST® type connectors at the *SLC*-2000 OLIU end. The other end's connector must match the connector of the vendor's fiber cross-connect panel.

Use care when routing the fiber cable in order not to pinch or severely bend the cable especially when routing under the ARM shelf and through the grommeted slots.

NOTE:
The minimum bending radius of the fiber cable is two inches (four inches diameter).

Fiber cables should be run apart from other cables in a separate protected duct.

Installation Procedure for Installing Fiber Optic Cables to the ARM Shelf

Step 1: Label both ends of the fiber cables in accordance with their associated OLIU, i.e. Main 1 IN, Main 1 OUT, etc.

Step 2: Route the fiber in accordance with Figure 3-46. Note the entry is from the left cable duct, under the ARM shelf and through the grommeted holes under the associated OLIU. The OLIUs will not be in place at this time so enough slack must be left to reach the terminating points on the units when they are installed.

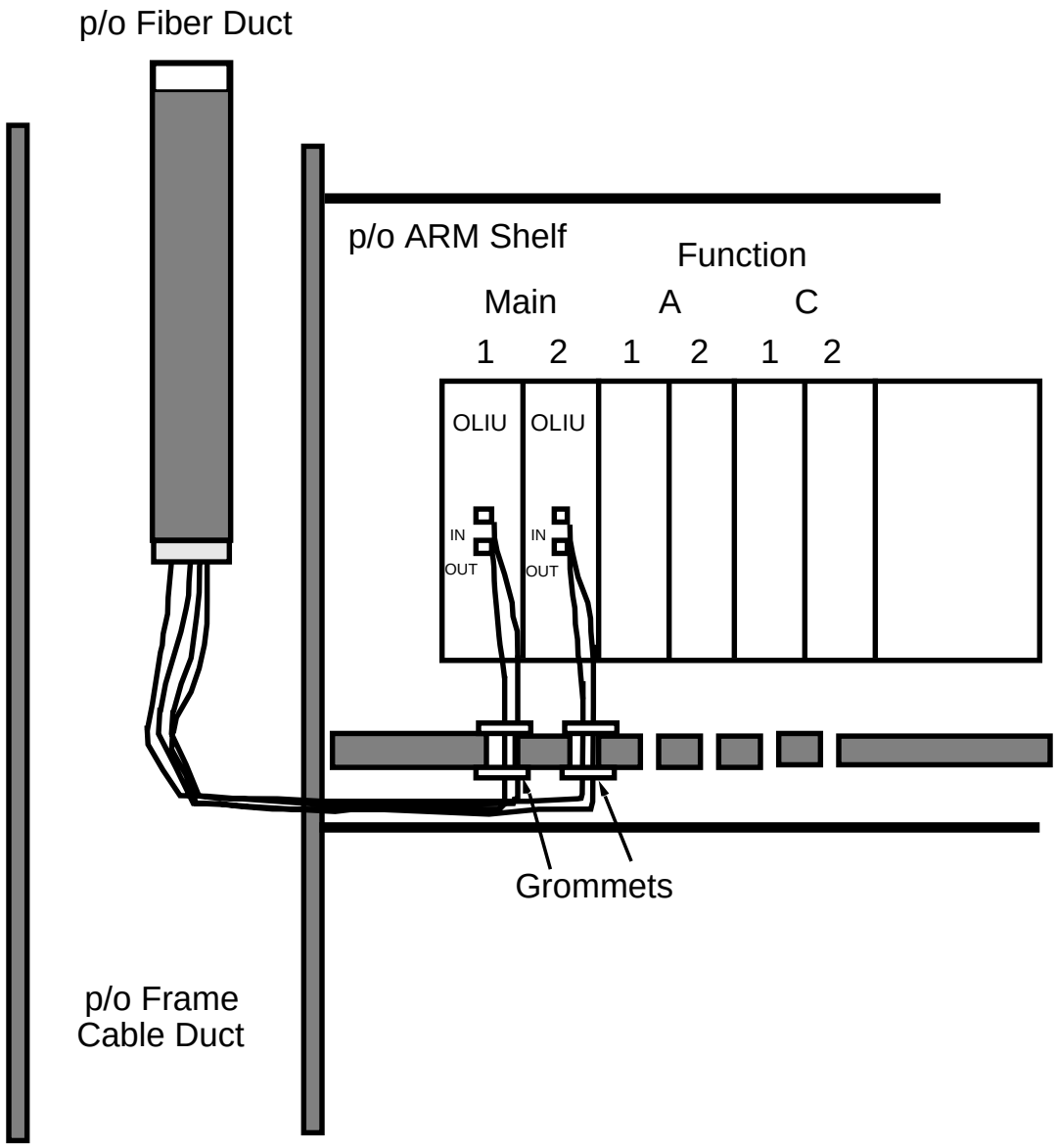


Figure 3-46. Optical Fiber Routing

Connecting Procedure for HDOS Fiber Optic Cables

General

Fiber jumpers must be single mode with ST® type connectors at the HDOS Optical Unit (OU) end. The other end's connector must match the connector of the vendor's fiber cross-connect panel.

Use care when routing the fiber cable in order not to pinch or severely bend the cable especially when routing in the left duct. Route the fiber in accordance with Figure 3-47 and the instructions below.

NOTE:
The minimum bending radius of the fiber cable is two inches (four inches diameter).

Fiber cables should be run apart from other cables in a separate protected duct.

Connections

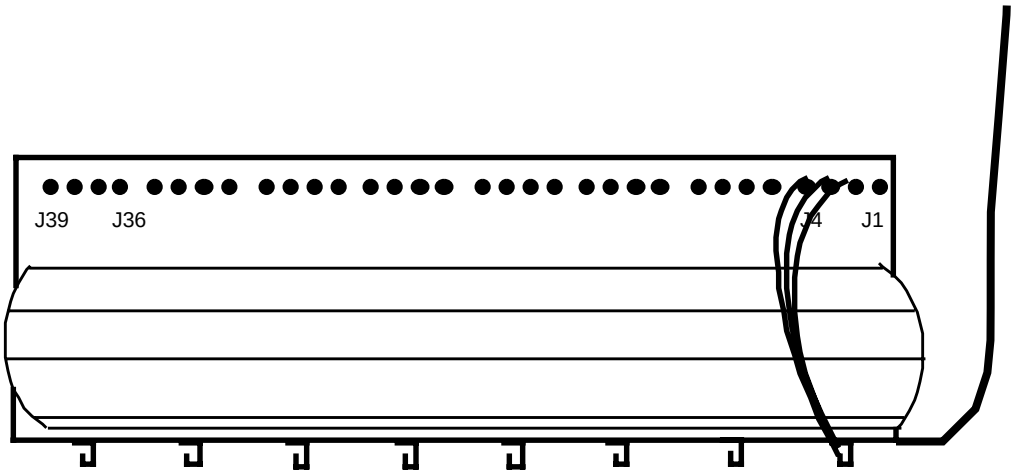
Step 1: Label both ends of the fiber cables in accordance with their associated OU position, i.e. 1/2, 9/10, etc.

Step 2: Remove the protective rubber cap from the assigned position at the rear of the HDOS and connect one end of the optical fiber jumper cable.

Step 3: Route the fiber cable over the ribbed cage to the bottom of the shelf and then into one of the eight plastic troughs associated with the set of four OU positions (J1-J4, J6-J9, through J36-J39).

Step 4: Bring the fiber cable to the left cable duct (as viewed from the front) by way of the other plastic duct located at the bottom and running the width of the shelf.

Step 5: Route these fiber cables to share the same fiber duct as the ARM Shelf fiber cables.



Rear View HDOS

Figure 3-47. HDOS Fiber Cable Routing

RT Input Alarms

General

NOTE:
This procedure consists of installing the RT Input Alarms Customer Interface Cable Assembly (ED7C723-35 Group 8) and mating its connector to the Standard Bay Cable Assembly [ED7C723-34 Group 2()] which had been installed earlier.

Pins 4 and 5 on this 6 pin connector are not assigned (Test 1 and Test 2). The rest are brought out to the MDF for cross connections to the office Major, Minor and Power Minor alarms.

Power Minor alarm is used to detect the loss of commercial ac power at the RT. Major alarm is used to detect the failure of the external ringing supply to the system. Minor alarm is used to detect a single rectifier failure in the bulk power system (if applicable), or a single (protected) ringing generator, or a cooling fan failure.

The MESGRD lead (pin 6) should be connected to a local quiet ground. This point is required to provide a quiet measurement reference ground for VF pair testing (ITH application).

Connections for ED7C723-34 Group 2

Step 1: Install the Alarm Interface Cable Assembly in the right duct and mate its J304 connector with the P304 connector of the Standard Bay Cable Assembly [ED7C723-34 Group 2()].

Step 2: Terminate the cable at the MDF and label the leads in accordance with Figure 3-48.

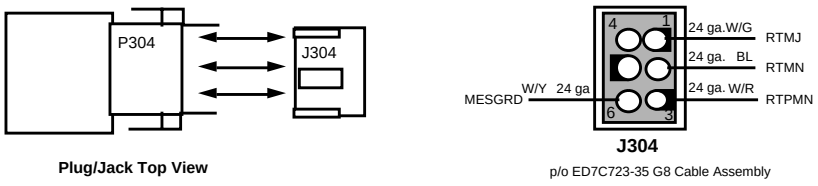


Figure 3-48. Alarms Connections

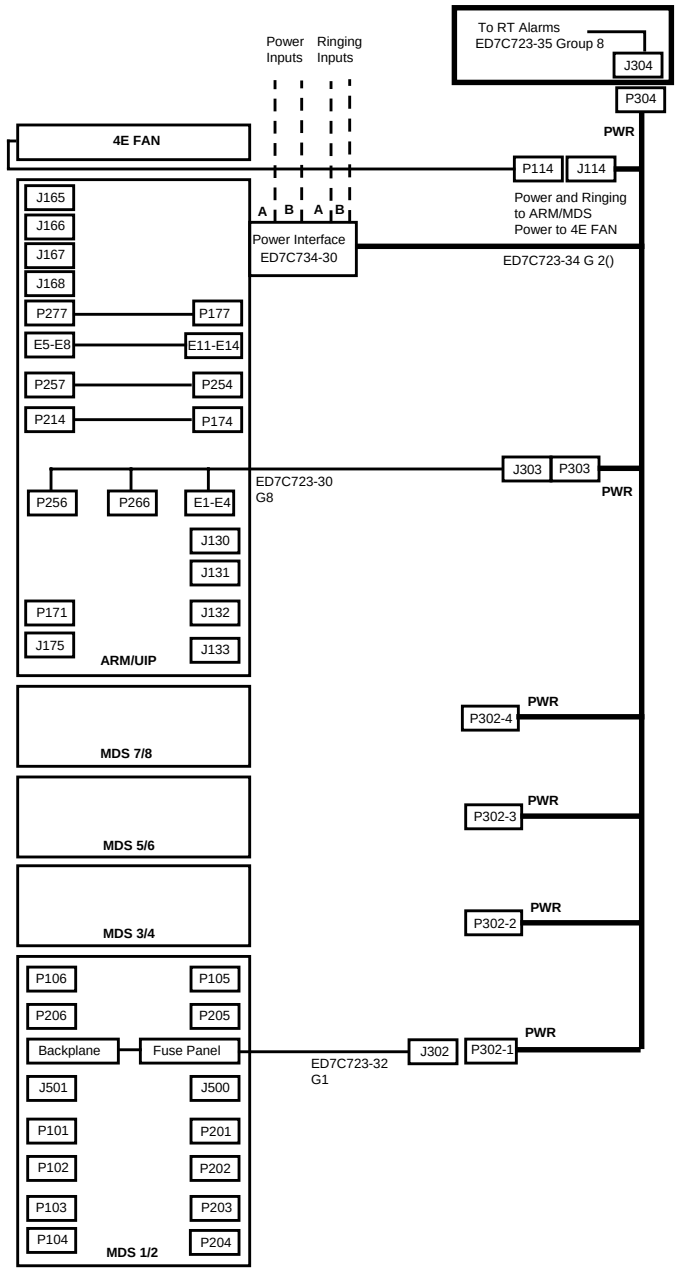


Figure 3-49. RT Input Alarms Interconnection

DSX-1 Metallic Feeder for FiberReach and MSDT

General

This application is for a metallic DS-1 interface between the MDS shelf containing the DT server (for example, SPQ®808, *SPQ*809, or *SPQ*810) and the DSX-1 interface. The DSX-1 cross-connect panel could be cabled to a DDM-2000 FiberReach Wideband Shelf, FITL HDOS shelf, or a T1 Carrier Office Repeater Bay, etc.

Connections for MDS to DSX-1

This procedure consists of installing mating cables to the bay cable which is normally part of the transmission path between the MDS and HDOS shelves and terminating their other end at the DSX-1.

The procedure below is for one shelf. Up to eight shelves can be connected for FITL DT server connections.

Step 1: Install the MDS/HDOS transmission cable assembly, ED7C723-35, Group 17 by connecting the cable to the MDS danglers (J101 through J104 or J201 through J204) associated with the shelf populated with FITL DT server(s).

Step 2: Mate a pair of DSX-1 interface cables (ED7C723-35, Group 19, 20, 21, or 22, for example) for each transmit (OUT) and receive (IN) arm of the Group 17 cable assembly's P191 or P192 connectors. Stamp each connector with a designation which agrees with its mating connector (i.e. J191-OUT mating to P191-OUT). Identify the butt cut end of the cable with a similar stamp or label.

NOTE:
The ED7C723-35 DSX-1 interface cable is available in four lengths.

Length (ft.)	Equipment Code	Comcode
30.0	ED7C723-35, Group 19	601845472
50.0	ED7C723-35, Group 20	601845480
100.0	ED7C723-35, Group 21	601845498
200.0	ED7C723-35, Group 22	601845506

Step 3: Find a convenient place on the frame, scrape the paint, and attach the lug from the drain wire to the frame with a 12-24 panel mounting screw (Comcode 801486341).

Step 4: Repeat Steps 2 and 3 for the second DSX-1 interface cable that mates with the P191/P192-IN connector.

Step 5: Terminate the transmit pairs at the DSX and label the leads in accordance with Figure 3-50() and Table 3-8() for Enhanced FiberReach/ MSDT applications or Table 3-9 for FiberReach/MSDT applications.

Step 6: Terminate the receive pairs at the DSX and label the leads in accordance with Figure 3-50() and Table 3-8() for Enhanced FiberReach/ MSDT applications or Table 3-9 for FiberReach/MSDT applications.

NOTE:
Transmit (T, R) and Receive (T1, R1) pairs are run in separate cables to the DSX. The cable shields must be grounded at the RT frame and the Transmit (OUT) and Receive (IN) cables shall not be mixed on the same cross-connect block.

Step 7: Repeat Steps 1 through 6 for other MDS, as required.

Connections for HDOS to DSX-1

This procedure consists of installing the ED7C723-35, Group 18 cables to J191() and J192() of a miscellaneously mounted HDOS shelf and terminating their other end at the DSX-1 panel. The HDOS must be located within 25 cable running feet of the DSX-1 panel, either in the same frame or an adjacent frame.

Step 1: Label the connectorized end of the first cable P191-1. See Table 3-10() for HDOS circuit pack slot association.

Step 2: Connect the first ED7C723-35, Group 18 cable to P191-1 on the HDOS shelf.

Step 3: Terminate the pairs at the DSX and label the leads in accordance with Figure 3-50B and Table 3-10().

NOTE:
Transmit (T, R) and Receive (T1, R1) pairs are run in the same cables to the DSX. The Transmit (OUT) and Receive (IN) pairs shall not be mixed on the same cross-connect block.

Step 4: Label the connectorized end of the second cable P192-1. See Table 3-10() for HDOS circuit pack slot association.

Step 5: Connect the second ED7C723-35, Group 18 cable to P192-1 on the HDOS shelf.

Step 6: Terminate the pairs at the DSX and label the leads in accordance with Figure 3-50B and Table 3-10().

NOTE:
Transmit (T, R) and Receive (T1, R1) pairs are run in the same cables to the DSX. The Transmit (OUT) and Receive (IN) pairs shall not be mixed on the same cross-connect block.

Step 7: Repeat Steps 1 through 6 to connect the third and fourth ED7C723-35, Group 18 cables to P191-2 and P192-2 as required.

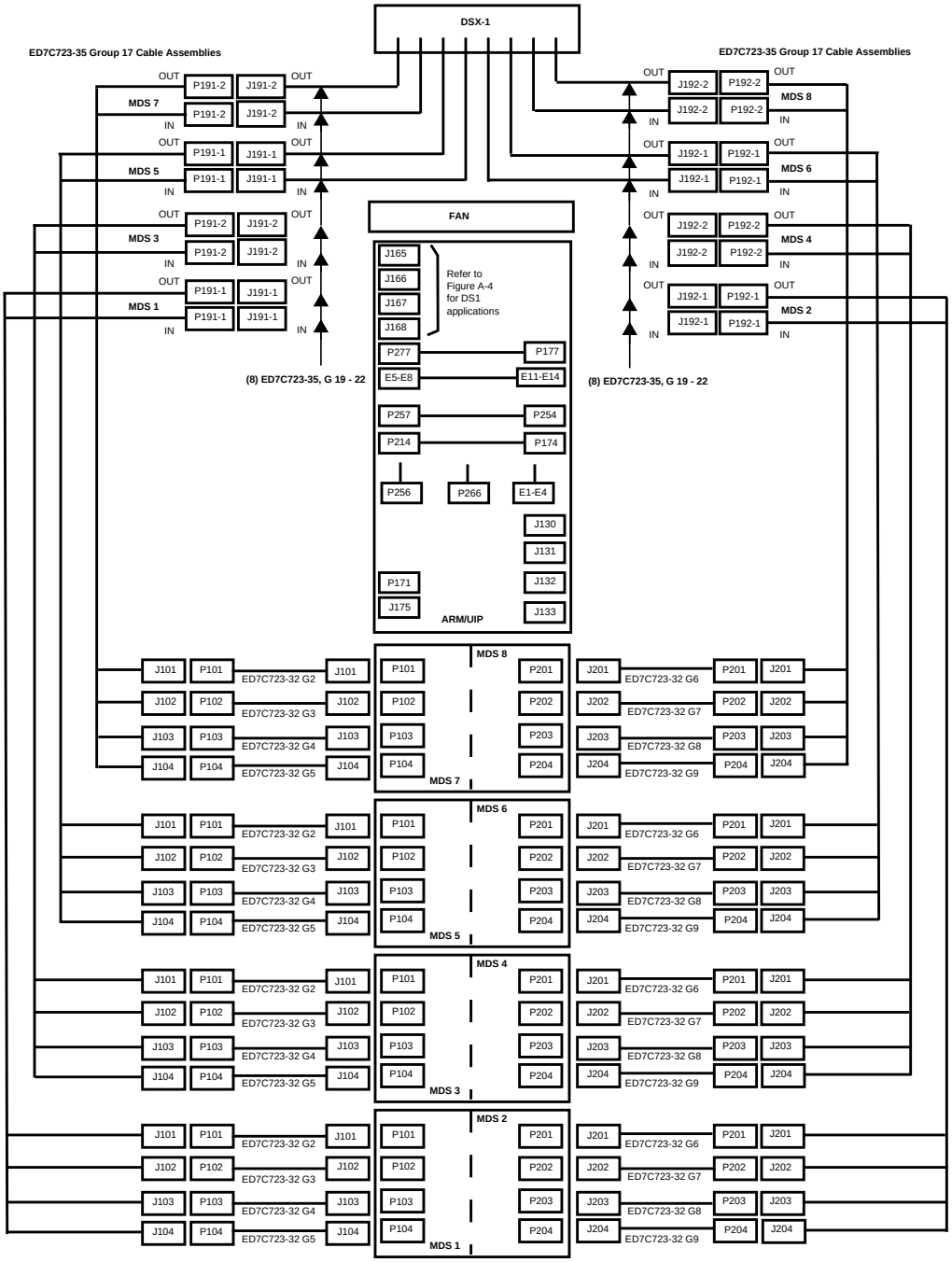


Figure 3-50A. MDS/DSX-1 Metallic Interface

Table 3-8A. MDS Server Circuit Pack Slot Association for Enhanced FiberReach/MSDT Applications (Odd Shelves)

Shelf No.	Shelf Connector	Pins R, T	MDS Slot CU ()	ED7C723-35, G 17 P191/P192		DSX-1 Colors (color code 4)
				Connector	Pins R, T	
1 (Odd)	J101	1, 26	1	OUT	1, 26	BL-W, W-BL
		2, 27		IN	1, 26	BL-W, W-BL
		9, 34	3	OUT	2, 27	O-W, W-O
		10, 35		IN	2, 27	O-W, W-O
		17,42	5	OUT	3, 28	G-W, W-G
		18, 43		IN	3, 28	G-W, W-G
		25, 50	7	OUT	4, 29	BR-W, W-BR
	J102	1, 26		IN	4, 29	BR-W, W-BR
		8, 33	9	OUT	5, 30	S-W, W-S
		9, 34		IN	5, 30	S-W, W-S
		16, 41	11	OUT	6, 31	BL-R, R-BL
		17,42		IN	6, 31	BL-R, R-BL
		24, 49	13	OUT	7, 32	O-R, R-O
		25, 50		IN	7, 32	O-R, R-O
	J103	7, 32	15	OUT	8, 33	G-R, R-G
		8, 33		IN	8, 33	G-R, R-G
		15, 40	17	OUT	9, 34	BR-R, R-BR
		16, 41		IN	9, 34	BR-R, R-BR
		23, 48	19	OUT	10, 35	S-R, R-S
		24, 49		IN	10, 35	S-R, R-S
	J104	6, 31	21	OUT	11, 36	BL-BK, BK-BL
		7, 32		IN	11, 36	BL-BK, BK-BL
		14, 39	23	OUT	12, 37	O-BK, BK-O
		15, 40		IN	12, 37	O-BK, BK-O

Table 3-8B. MDS Server Circuit Pack Slot Association for Enhanced FiberReach/MSDT Applications (Even Shelves)

Shelf No.	Shelf Connector	Pins R, T	MDS Slot CU ()	ED7C723-35, G 17 P191/P192		DSX-1 Colors (color code 4)
				Connector	Pins R, T	
2 (Even)	J201	1, 26	1	OUT	1, 26	BL-W, W-BL
		2, 27		IN	1, 26	BL-W, W-BL
		9, 34	3	OUT	2, 27	O-W, W-O
		10, 35		IN	2, 27	O-W, W-O
		17,42	5	OUT	3, 28	G-W, W-G
		18, 43		IN	3, 28	G-W, W-G
		25, 50	7	OUT	4, 29	BR-W, W-BR
	J202	1, 26		IN	4, 29	BR-W, W-BR
		8, 33	9	OUT	5, 30	S-W, W-S
		9, 34		IN	5, 30	S-W, W-S
		16, 41	11	OUT	6, 31	BL-R, R-BL
		17,42		IN	6, 31	BL-R, R-BL
		24, 49	13	OUT	7, 32	O-R, R-O
		25, 50		IN	7, 32	O-R, R-O
	J203	7, 32	15	OUT	8, 33	G-R, R-G
		8, 33		IN	8, 33	G-R, R-G
		15, 40	17	OUT	9, 34	BR-R, R-BR
		16, 41		IN	9, 34	BR-R, R-BR
		23, 48	19	OUT	10, 35	S-R, R-S
		24, 49		IN	10, 35	S-R, R-S
	J204	6, 31	21	OUT	11, 36	BL-BK, BK-BL
		7, 32		IN	11, 36	BL-BK, BK-BL
		14, 39	23	OUT	12, 37	O-BK, BK-O
		15, 40		IN	12, 37	O-BK, BK-O

Table 3-9. MDS Server Circuit Pack Slot Association for FiberReach/MSDT Applications (MSDT)

Shelf No.	Shelf Connector	Pins R, T	MDS Slot CU ()	ED7C723-35, G 17 P191/P192		DSX-1 Colors (color code 4)
				Connector	Pins R, T	
1 (Odd)	J101	1, 26	1	OUT	1, 26	BL-W, W-BL
		2, 27		IN	1, 26	BL-W, W-BL
		9, 34	3	OUT	2, 27	O-W, W-O
		10, 35		IN	2, 27	O-W, W-O
		17,42	5	OUT	3, 28	G-W, W-G
		18, 43		IN	3, 28	G-W, W-G
		25, 50	7	OUT	4, 29	BR-W, W-BR
	J102	1, 26		IN	4, 29	BR-W, W-BR
		24, 49	13	OUT	7, 32	O-R, R-O
		25, 50		IN	7, 32	O-R, R-O
	J103	7, 32	15	OUT	8, 33	G-R, R-G
		8, 33		IN	8, 33	G-R, R-G
		15, 40	17	OUT	9, 34	BR-R, R-BR
		16, 41		IN	9, 34	BR-R, R-BR
		23, 48	19	OUT	10, 35	S-R, R-S
		24, 49		IN	10, 35	S-R, R-S
2 (Even)	J201	1, 26	1	OUT	1, 26	BL-W, W-BL
		2, 27		IN	1, 26	BL-W, W-BL
		9, 34	3	OUT	2, 27	O-W, W-O
		10, 35		IN	2, 27	O-W, W-O
		17,42	5	OUT	3, 28	G-W, W-G
		18, 43		IN	3, 28	G-W, W-G
		25, 50	7	OUT	4, 29	BR-W, W-BR
	J202	1, 26		IN	4, 29	BR-W, W-BR
		24, 49	13	OUT	7, 32	O-R, R-O
		25, 50		IN	7, 32	O-R, R-O
	J203	7, 32	15	OUT	8, 33	G-R, R-G
		8, 33		IN	8, 33	G-R, R-G
		15, 40	17	OUT	9, 34	BR-R, R-BR
		16, 41		IN	9, 34	BR-R, R-BR
		23, 48	19	OUT	10, 35	S-R, R-S
		24, 49		IN	10, 35	S-R, R-S

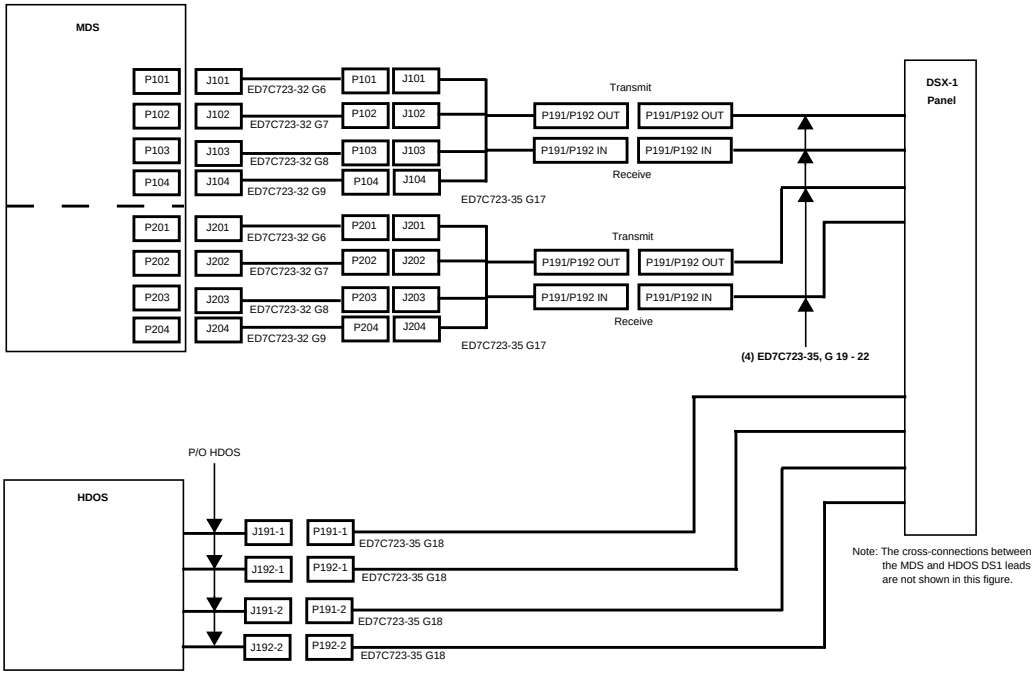


Figure 3-50B. DSX-1 Panel Cabling

Table 3-10A. HDOS/DSX-1 Circuit Pack Slot Association

HDOS				ED7C723-35, Group 18		DSX-1 Block
BP Connector	Pins R, T	OU Slot	Shelf Connector	Pins R, T	Colors (color code 4)	
J1	9, 18	1	J191-1	1, 26	BL-W, W-BL	OUT
	8, 17			2, 27	O-W, W-O	IN
J2	9, 18	3		3, 28	G-W, W-G	OUT
	8, 17			4, 29	BR-W, W-BR	IN
J3	9, 18	5		5, 30	S-W, W-S	OUT
	8, 17			6, 31	BL-R, R-BL	IN
J4	9, 18	7		7, 32	O-R, R-O	OUT
	8, 17			8, 33	G-R, R-G	IN
J6	9, 18	13		9, 34	BR-R, R-BR	OUT
	8, 17			10, 35	S-R, R-S	IN
J7	9, 18	15		11, 36	BL-BK, BK-BL	OUT
	8, 17			12, 37	O-BK, BK-O	IN
J8	9, 18	17		13, 38	G-BK, BK-G	OUT
	8, 17			14, 39	BR-BK, BK-BR	IN
J9	9, 18	19		15, 40	S-BK, BK-S	OUT
	8, 17			16, 41	BL-Y, Y-BL	IN
J11	9, 18	1	J192-1	1, 26	BL-W, W-BL	OUT
	8, 17			2, 27	O-W, W-O	IN
J12	9, 18	3		3, 28	G-W, W-G	OUT
	8, 17			4, 29	BR-W, W-BR	IN
J13	9, 18	5		5, 30	S-W, W-S	OUT
	8, 17			6, 31	BL-R, R-BL	IN
J14	9, 18	7		7, 32	O-R, R-O	OUT
	8, 17			8, 33	G-R, R-G	IN
J16	9, 18	13		9, 34	BR-R, R-BR	OUT
	8, 17			10, 35	S-R, R-S	IN
J17	9, 18	15		11, 36	BL-BK, BK-BL	OUT
	8, 17			12, 37	O-BK, BK-O	IN
J18	9, 18	17		13, 38	G-BK, BK-G	OUT
	8, 17			14, 39	BR-BK, BK-BR	IN
J19	9, 18	19		15, 40	S-BK, BK-S	OUT
	8, 17			16, 41	BL-Y, Y-BL	IN

Table 3-10B. HDOS/DSX-1 Circuit Pack Slot Association (cont)

HDOS				ED7C723-35, Group 18		DSX-1 Block
BP Connector	Pins R, T	OU Slot	Shelf Connector	Pins R, T	Colors (color code 4)	
J21	9, 18	1	J191-2	1, 26	BL-W, W-BL	OUT
	8, 17			2, 27	O-W, W-O	IN
J22	9, 18	3		3, 28	G-W, W-G	OUT
	8, 17			4, 29	BR-W, W-BR	IN
J23	9, 18	5		5, 30	S-W, W-S	OUT
	8, 17			6, 31	BL-R, R-BL	IN
J24	9, 18	7		7, 32	O-R, R-O	OUT
	8, 17			8, 33	G-R, R-G	IN
J26	9, 18	13		9, 34	BR-R, R-BR	OUT
	8, 17			10, 35	S-R, R-S	IN
J27	9, 18	15		11, 36	BL-BK, BK-BL	OUT
	8, 17			12, 37	O-BK, BK-O	IN
J28	9, 18	17		13, 38	G-BK, BK-G	OUT
	8, 17			14, 39	BR-BK, BK-BR	IN
J29	9, 18	19		15, 40	S-BK, BK-S	OUT
	8, 17			16, 41	BL-Y, Y-BL	IN
J31	9, 18	1	J192-2	1, 26	BL-W, W-BL	OUT
	8, 17			2, 27	O-W, W-O	IN
J32	9, 18	3		3, 28	G-W, W-G	OUT
	8, 17			4, 29	BR-W, W-BR	IN
J33	9, 18	5		5, 30	S-W, W-S	OUT
	8, 17			6, 31	BL-R, R-BL	IN
J34	9, 18	7		7, 32	O-R, R-O	OUT
	8, 17			8, 33	G-R, R-G	IN
J36	9, 18	13		9, 34	BR-R, R-BR	OUT
	8, 17			10, 35	S-R, R-S	IN
J37	9, 18	15		11, 36	BL-BK, BK-BL	OUT
	8, 17			12, 37	O-BK, BK-O	IN
J38	9, 18	17		13, 38	G-BK, BK-G	OUT
	8, 17			14, 39	BR-BK, BK-BR	IN
J39	9, 18	19		15, 40	S-BK, BK-S	OUT
	8, 17			16, 41	BL-Y, Y-BL	IN

DC Test Path Interfaces

General

NOTE:
This procedure consists of installing the DC Test Path Customer Interface Cable Assembly (ED7C723-35 Group 12) and mating its connector to the TAP Cable Assembly (ED7C723-34 Group 1) which had been installed in a previous section.

NOTE:
Only one pair on this 50 pin connector is used and is brought out to the miscellaneous pair panel for cross connection to the DC test pair of the test access system. Two pairs are reserved for future use and should be tied back at the cross connect panel.

Connections for ED7C723-35 Group 12

Step 1: Install the Group 12 Interface Cable Assembly in the left duct and mate its J301 connector with the P301 connector of the TAP Cable Assembly.

Step 2: Terminate only the DC Test Pair at the miscellaneous pair panel and label the leads in accordance with the Figure 3-51.

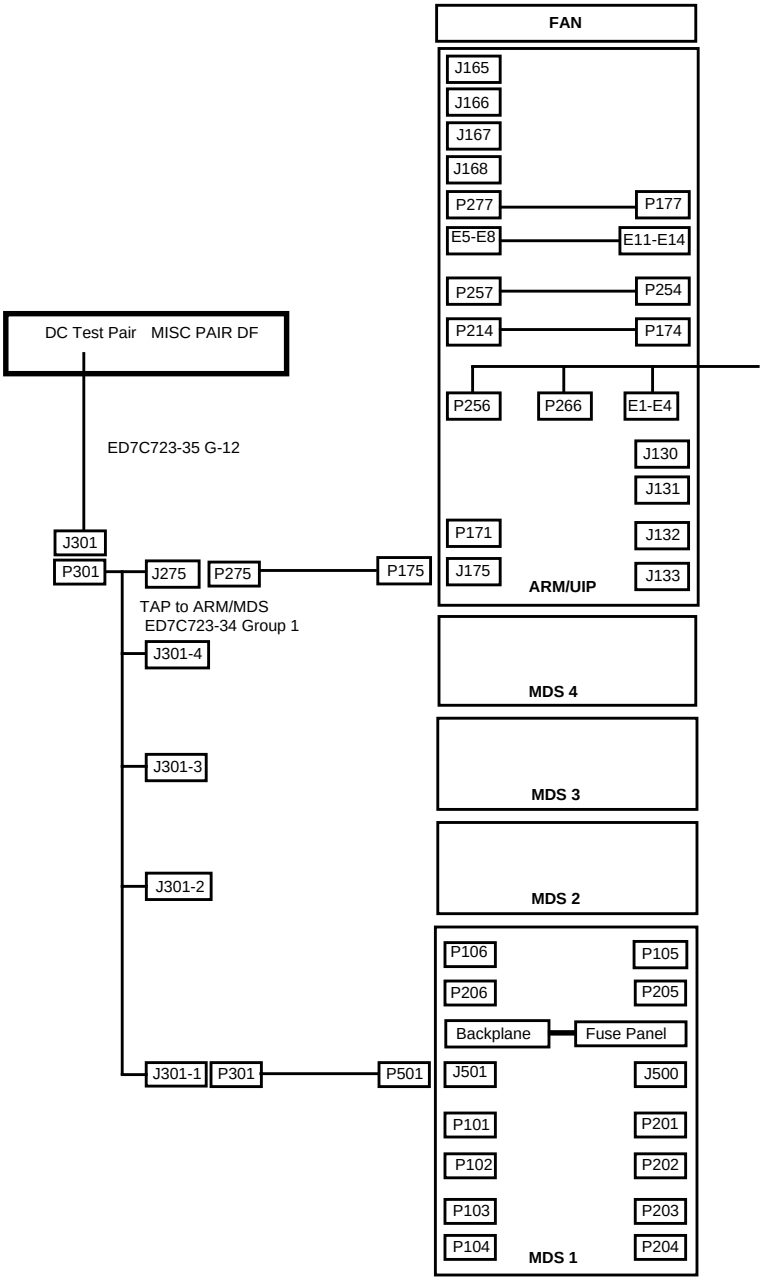


Figure 3-51. DC Test Pair Interconnection

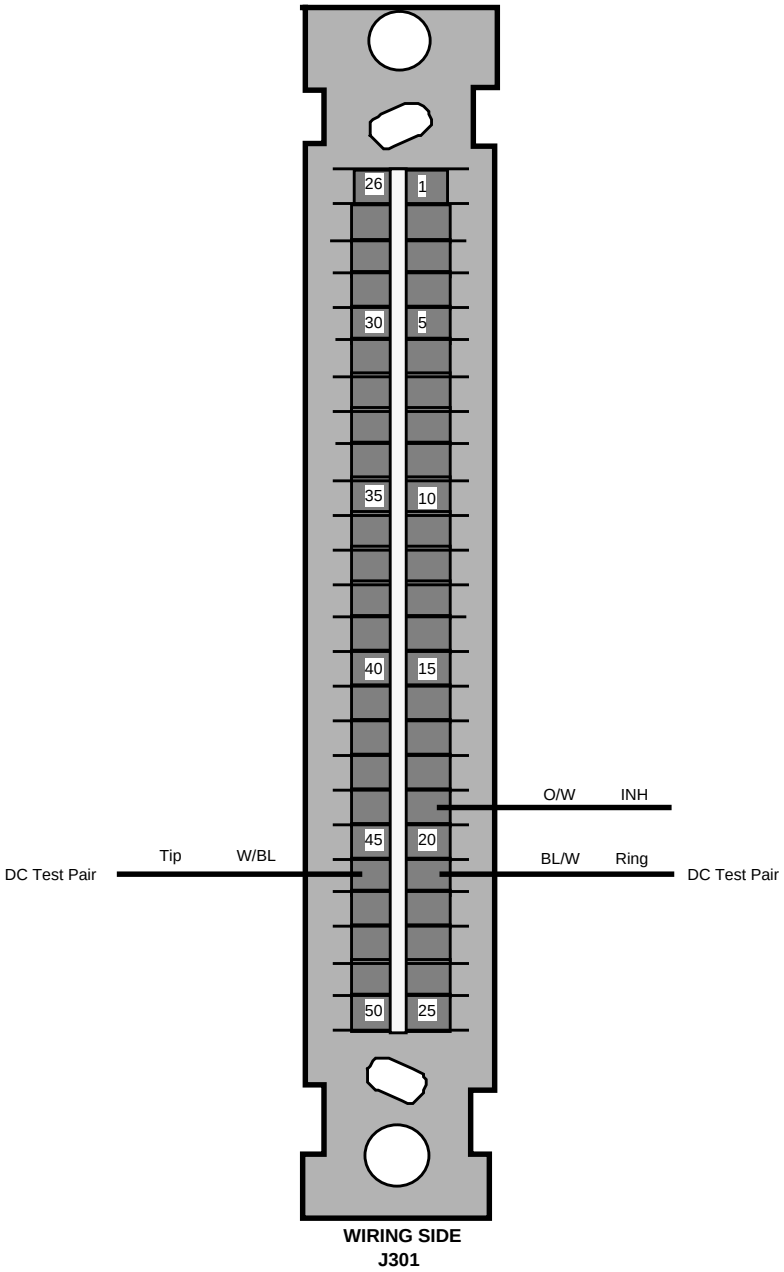


Figure 3-52. DC Test Pair J301 Wiring

External Test Head Interconnections

General

These procedures install the interconnect cables between the external test heads (*4TEL RMU*[*] and/or Reliance INTS) and their associated power panels and between these test heads and the *SLC*-2000 RT system interfaces. When several RT systems (up to 8) are deployed at one site the Line Test Fanout (LTF) unit and its interconnecting cables must be utilized. Refer to the associated figures for the overall system interconnections.

NOTE:
Refer to the Teradyne, Inc. and Reliance, Inc. related documents for installation instructions for their test head panels and associated power panels.

Common Cables

RT *RMU* Link ED7C723-30 Group 17

This cable assembly is a dangler cable, providing a RS232 control link to the external test heads. This cable must be installed from the ARM backplane connector to the front cable duct for further connection to the test heads or the LTF.

Step 1: Mate the P44 end of the cable with the ARM shelf's J44 connector.

Step 2: Route the cable over the top of the ARM shelf and into the front right cable duct. Position the cable in the duct so that its J44 connector is accessible to mate with an external cable.

Step 3: Secure the cable assembly to the ARM shelf's tie points or to other adjacent cables.

* 4TEL and RMU are registered trademarks of Teradyne, Inc.

Reliance INTS Link Cable ED7C723-30 Group 18

This cable assembly is a dangler cable, providing a communications control link to the external test heads for special service test access. This cable must be installed from the ARM backplane connector to the front cable duct for further connection to the INTS test head.

Step 1: Mate the P183 end of the cable with the ARM shelf's J183 connector.

Step 2: Route the cable over the top of the ARM shelf and into the front right cable duct. Position the cable in the duct so that its J183 connector is accessible to mate with an external cable.

Step 3: Secure the cable assembly to the ARM shelf's tie points or to other adjacent cables.

DC Test Pair Cable ED7C723-35 Group 7

This cable assembly, containing only one test pair, is utilized with the *4TEL RMU* system and is the same as that associated with the metallic dc test path. Refer to the DC Test Path Interfaces section of this chapter for connecting information.

VF Pairs Multiple Cable ED7C723-34 Group 13

This Multiple cable is utilized in external test head applications (i.e. *RMU*) and connects to the MDS VF dangler cable, providing two connectors which access the same VF pairs. This cable arrangement allows the same VF pairs to be terminated at two different cross-connect locations, one for subscriber lines, the other for the test heads.

Step 1: Locate the VF dangler cable connector associated with the first MDS (P101 of the ED7C723-32 G2 cable for Channels 1-25).

Step 2: Connect the Multiple cable's J101 connector to the dangler's P101. If a VF cable to the FDI cross-connect is in place and connected to the dangler's P101 then disconnect it and re-connect it to the Multiple cable's P101A connector.

VF Pairs Cables ED7C723-35 Group 1, 2, or 3

Step 1: Add the additional VF interconnect cable (ED7C723-35 G1, 2, or 3) and connect its connector to the Multiple cable's P101B connector.

Step 2: Re-stamp the original ED7C723-35 VF cable's J101 connector as J101A and stamp the additional cable's connector as J101B.

Step 3: Connect the additional cable at the Misc. Pairs Cross-connect and designate the leads in accordance with Figure 3-32 associated with the J101B connector.

Test Bus (TAP) Multiple Cable ED7C723-34 Group 14

This multiple cable is used only in applications with multiple RT systems utilizing the LTF.

Step 1: Mate the cable's J301 connector with the bay's TAP Bus P301 connector. Replace the DC test Pair Cable ED7C723-35 Group 7 (refer to above paragraph) if it is in place.

Step 2: Position the cable so that its J301B connector is accessible at the top of the bay and its P101A connector is accessible for connections to the DC Test Pair cables.

DC Test Pair Cable ED7C723-35 Group 1, 2, or 3

This cable assembly, containing all test access pairs from the RT bay TAP bus, is utilized with the Reliance INTS system and connected to the Misc. Pairs Cross-connect block.

Step 1: Mate the cable's connector with the bay's TAP Bus P301 connector or TAP Bus P301A connector. Replace the DC Test Pair Cable ED7C723-35 Group 7 (refer to above paragraph) if it is in place.

Step 2: Stamp the connector as J301, terminate and label the leads in accordance with the associated figure in this section.

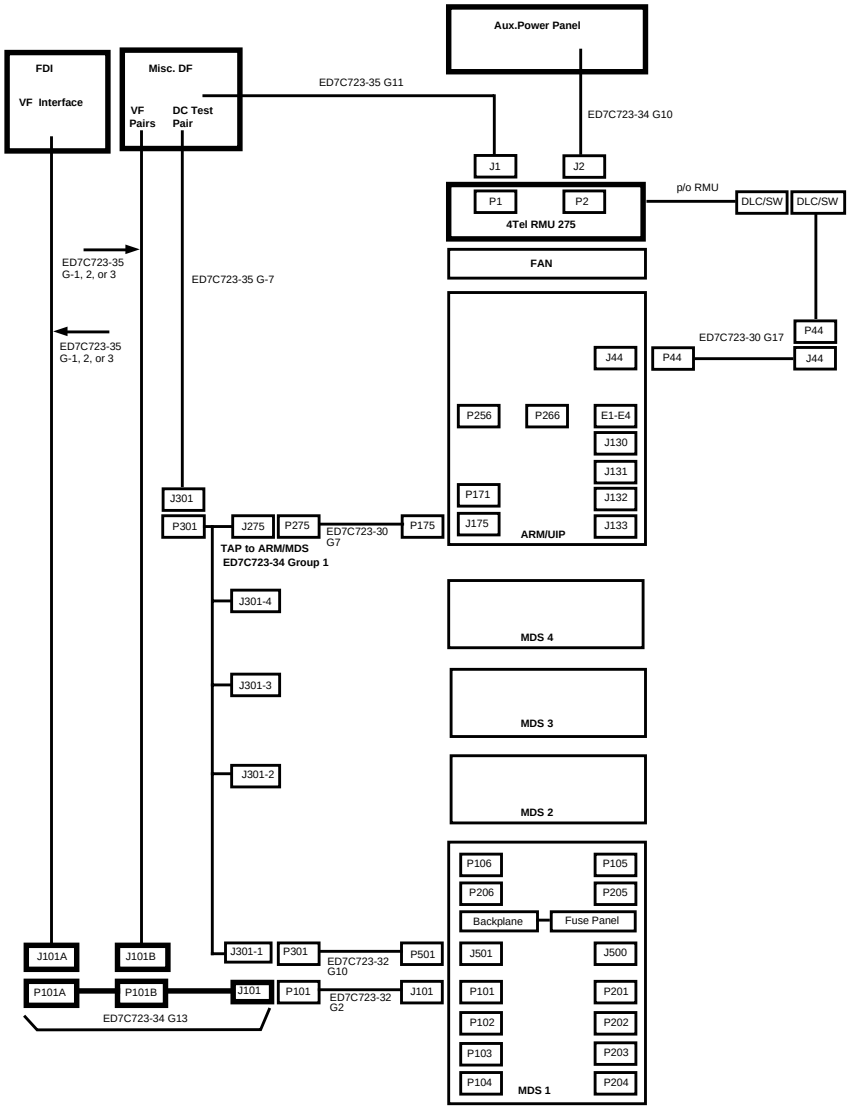


Figure 3-53A. *4TEL RMU* System Interconnections

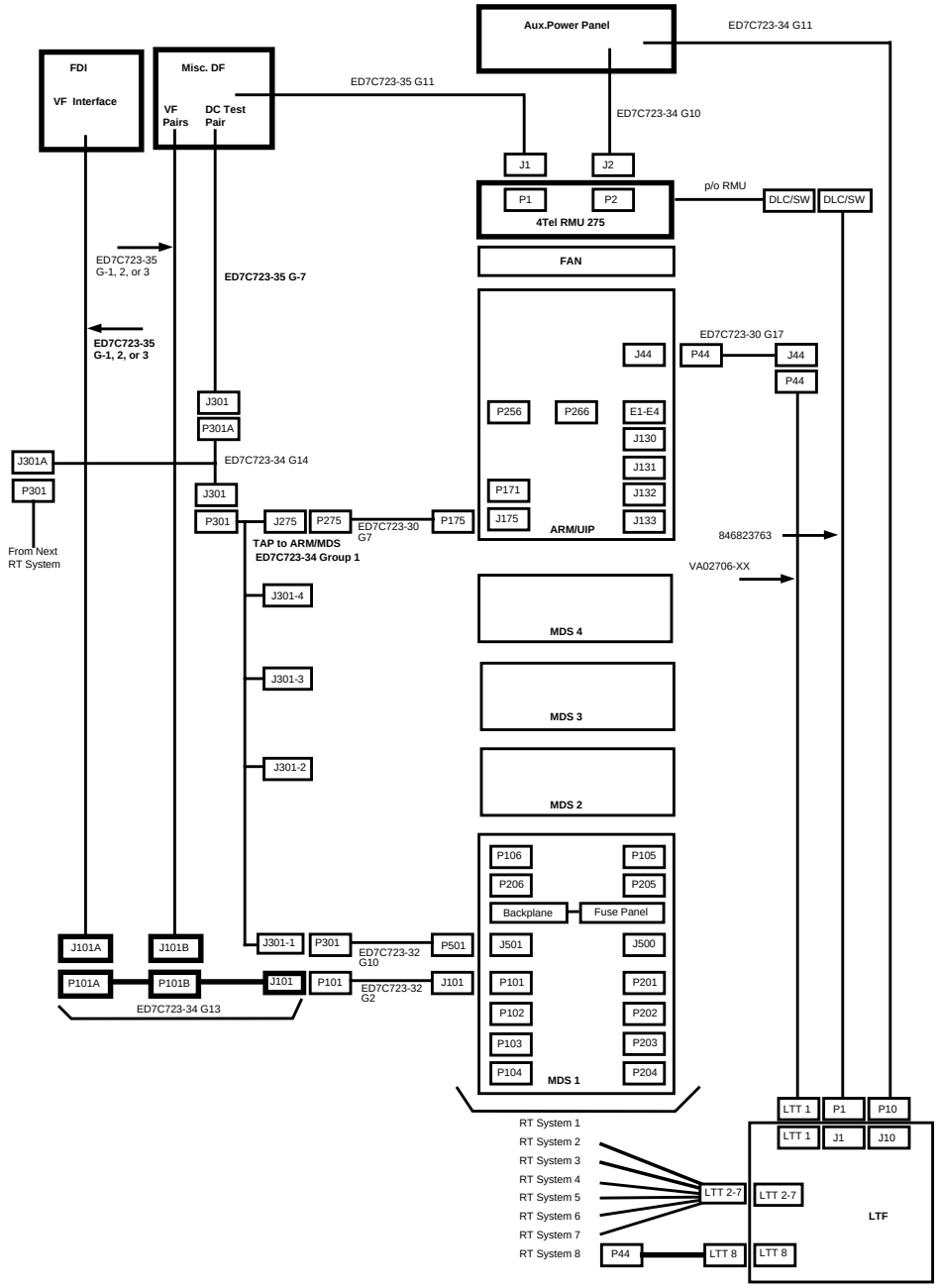


Figure 3-53B. *4TEL RMU*/LTF System Interconnections

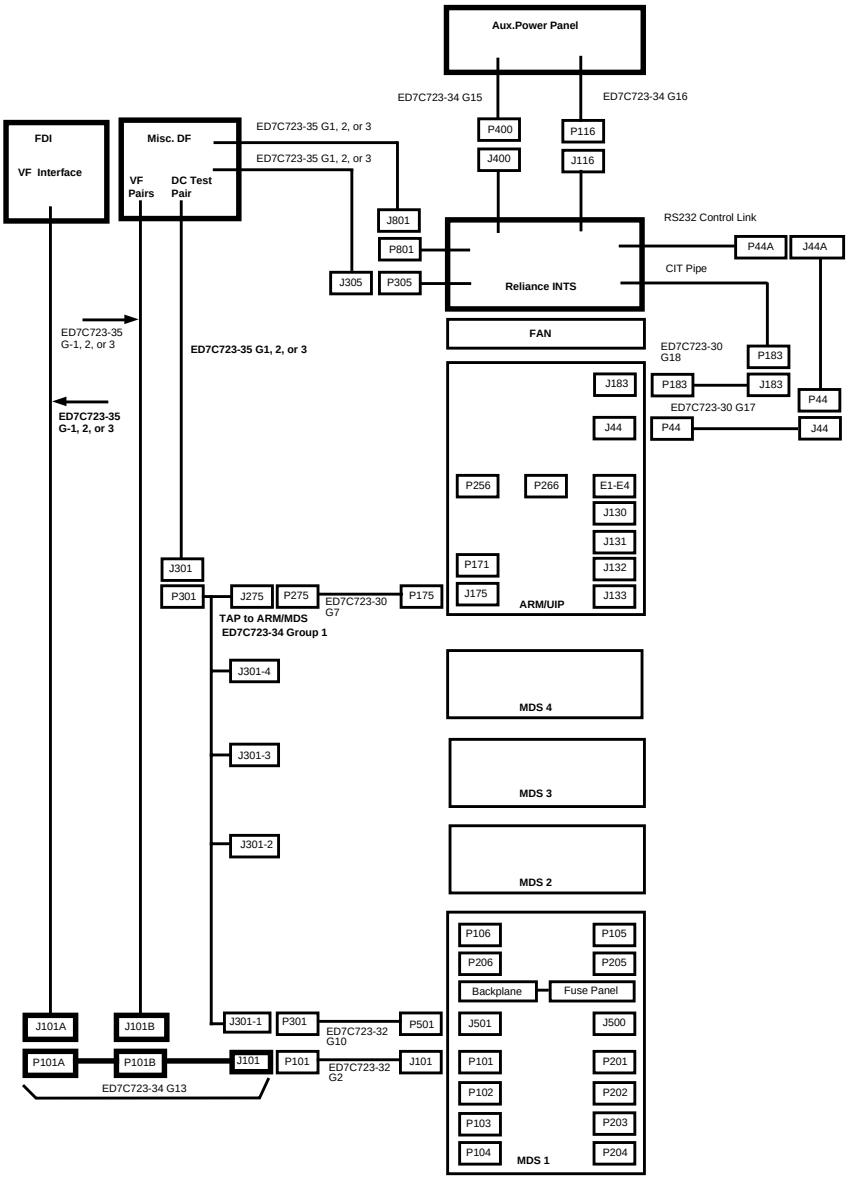


Figure 3-54A. Reliance INTS System Interconnections

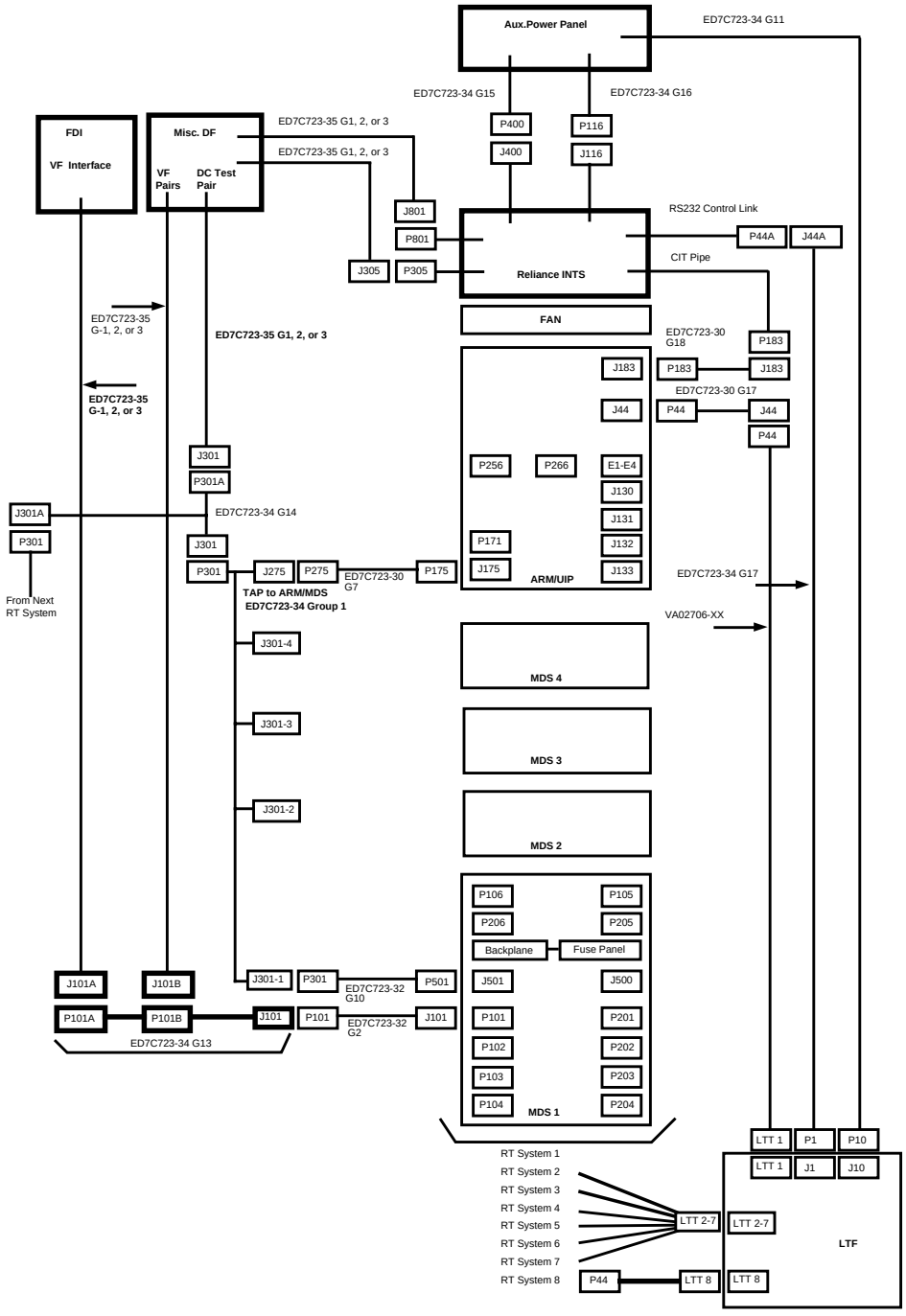


Figure 3-54B. INTS/LTF System Interconnections

4TEL RMU Interconnections

General

The *RMU* is powered (via J2) from -48v dc supplied by an Auxiliary Fuse Panel provided by the customer. The physical interface from the *RMU* to the *SLC*-2000 system is to the ARM shelf's RT *RMU* LINK or RT BUS connector J44. This is a DB9 connector with a RS-232 interface.

The *RMU* and the LTF, if required, should be located in the same frame as the Fuse Panel.

NOTE:
Refer to the Teradyne, Inc. and Reliance, Inc. related documents for installation instructions for their test head panels and associated power panels.

NOTE:
Refer to the LTF section of this Chapter for interconnecting details for multiple systems.

NOTE:
Refer to the APPLICATIONS Chapter for DC Test Pair cross-connection details.

Power Cable ED7C723-34 Group 10

This cable provides the -48v/RTN connections to the Auxiliary Fuse Panel.

Step 1: Connect the leads in accordance with the associated figure for the J2 connector at the assigned fuse positions for the *RMU*.

Step 2: Mate the J2 connector with P2 on the *RMU*.

Step 3: Assign the *RMU* fuse positions with 1 1/3 amp fuses.

NOTE:
One fuse may be assigned, if preferred, with multiple connections for the red (-48v) and black (RTN) wires from the J2 connector.

4TEL RMU Control Link Cable ED7C723-34 Group 9

This cable is the control link with the *RMU*. Refer to Figure 5-8 in Chapter 5 for its wiring details.

Step 1: Mate the SWITCH/DLC connector of the cable assembly to its associated connector on the *RMU*.

Step 2: Mate the cable's P44 connector to the J44 connector of the ARM shelf dangler cable ED7C723-30 Group 17 installed earlier.

DC Test Pair Cable ED7C723-35 Group 11

This cable assembly, containing a test access pair, 2 VF pairs, and a frame ground termination is connected to the Misc. Pairs Cross-connect block.

Step 1: Mate the cable's J1 connector with the *RMU*'s P1 connector.

Step 2: Terminate and label the leads in accordance with the associated figure for J1 in this section.

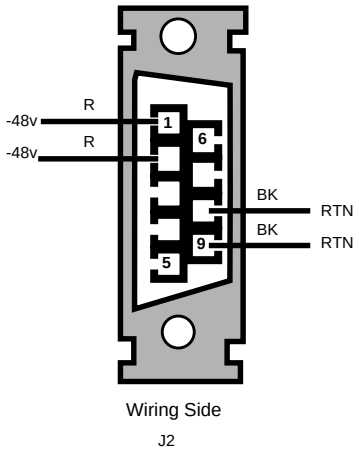


Figure 3-55. *4TEL RMU* Power Connections (ED7C723-34, Group 10)

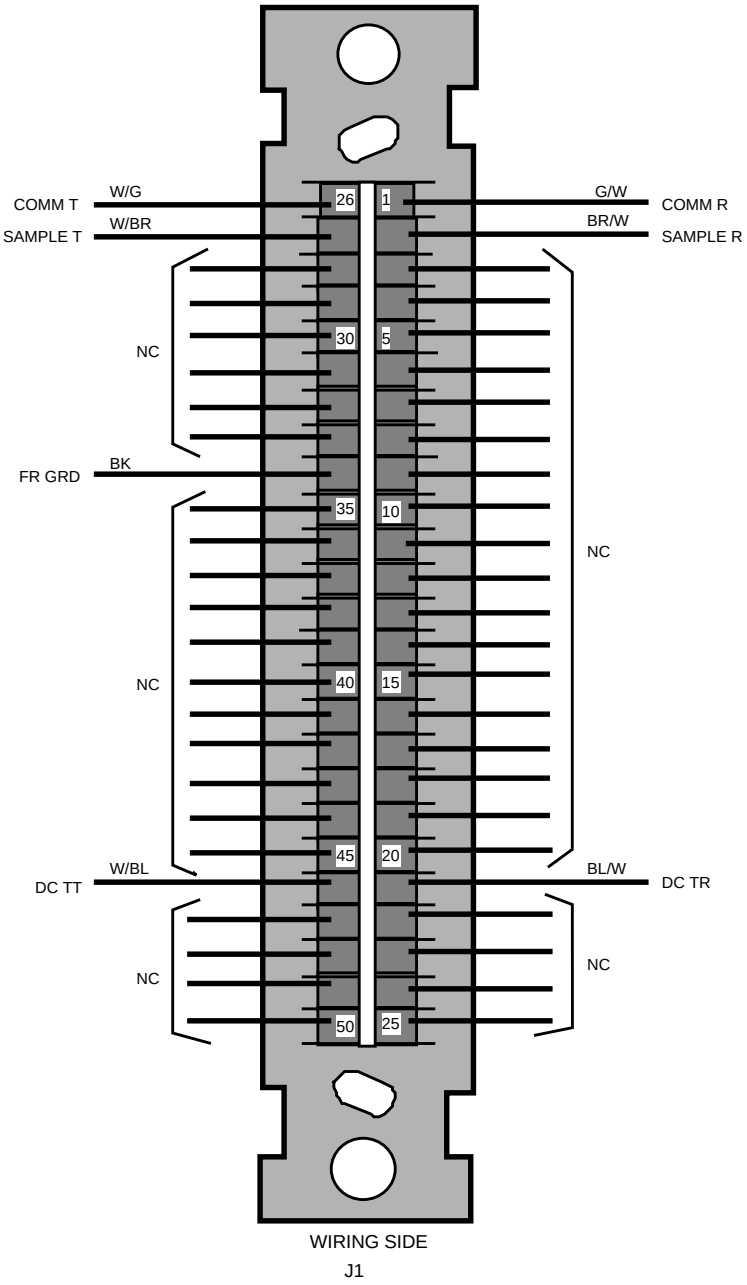


Figure 3-56. *4TEL RMU* Test Pair Wiring (ED7C723-35, Group 11)

Reliance INTS Interconnections

General

The INTS is powered (via J400) from -48v dc supplied by an Auxiliary Fuse Panel provided by the customer. This fuse panel also supplies 20Hz ringing to the INTS system via the P116 connector. The physical interface from the INTS to the *SLC*-2000 system is to the ARM shelf's RT *RMU* LINK or RT BUS connector J44 providing a control link. The communications path is through the ARM shelf's CATT CONTROL LINK connector J183, and the BBF250 LAN circuit pack for special service test access.

The INTS and the LTF, if required, should be located in the same frame as the Fuse Panel.

NOTE:
Refer to the Teradyne, Inc. and Reliance, Inc. related documents for installation instructions for their test head panels and associated power panels.

NOTE:
Refer to the LTF section of this Chapter for interconnecting details for multiple systems.

NOTE:
Refer to the APPLICATIONS Chapter for DC Test Pair cross-connection details.

Power Cable ED7C723-34 Group 15

This cable provides the -48v/RTN connection to the Auxiliary Fuse Panel.

Step 1: Connect the leads in accordance with the associated figure for the P400 connector at an assigned fuse position for the INTS.

Step 2: Mate the P400 connector with J400 on the INTS.

Step 3: Assign the INTS fuse position with a 3 amp fuse.

Ringing Cable ED7C723-34 Group 16

This cable provides the +20Hz/-20Hz ringing connections to the Auxiliary Fuse Panel.

Step 1: Connect the leads in accordance with the associated figure for the J116 connector at the assigned fuse positions for the INTS.

Step 2: Mate the J116 connector with P116 on the INTS.

Step 3: Assign the INTS fuse positions with a 1/2 amp fuse each for the positive and negative ringers.

INTS Control Link Cable

This cable is the control link with the INTS. Refer to Figure 5-7 in Chapter 5 for its wiring details.

Step 1: Locate the INTS's six foot dangler cable (RS232/P44) and route it into the front right cable duct.

Step 2: Mate the INTS cable's P44 connector to the J44 connector of the ARM shelf dangler cable ED7C723-30 Group 17 installed earlier.

INTS Communications Cable

This cable is the CIT link with the INTS. Refer to Figure 5-6 in Chapter 5 for its wiring details.

Step 1: Locate the INTS's six foot dangler cable (CIT/P183) and route it into the front right cable duct.

Step 2: Mate the INTS cable's P183 connector to the J183 connector of the ARM shelf dangler cable ED7C723-30 Group 18 installed earlier.

DC Test Pairs Cable ED7C723-35 Group 1, 2, or 3

This cable assembly, containing the test access pairs, is connected to the Misc. Pairs Cross-connect block.

Step 1: Mate the cable's J305 connector with the INTS's P305 connector.

Step 2: Terminate and label the leads in accordance with the associated figure for J305 in this section.

VF Pairs Cable ED7C723-35 Group 1, 2, or 3

This cable assembly, containing VF test pairs is connected to the Misc. Pairs Cross-connect block.

Step 1: Mate the cable's J801 connector with the INTS's P801 connector.

Step 2: Terminate and label the leads in accordance with the associated figure for J801 in this section.

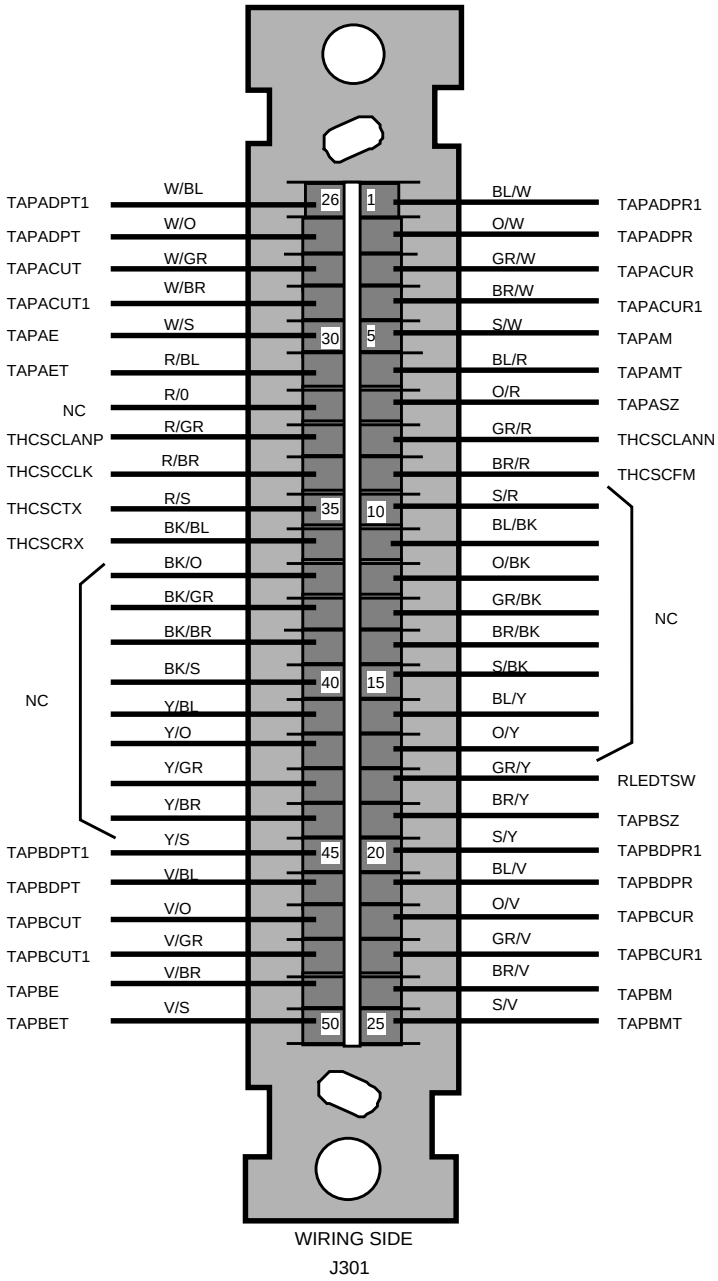


Figure 3-57. TAP Wiring J301

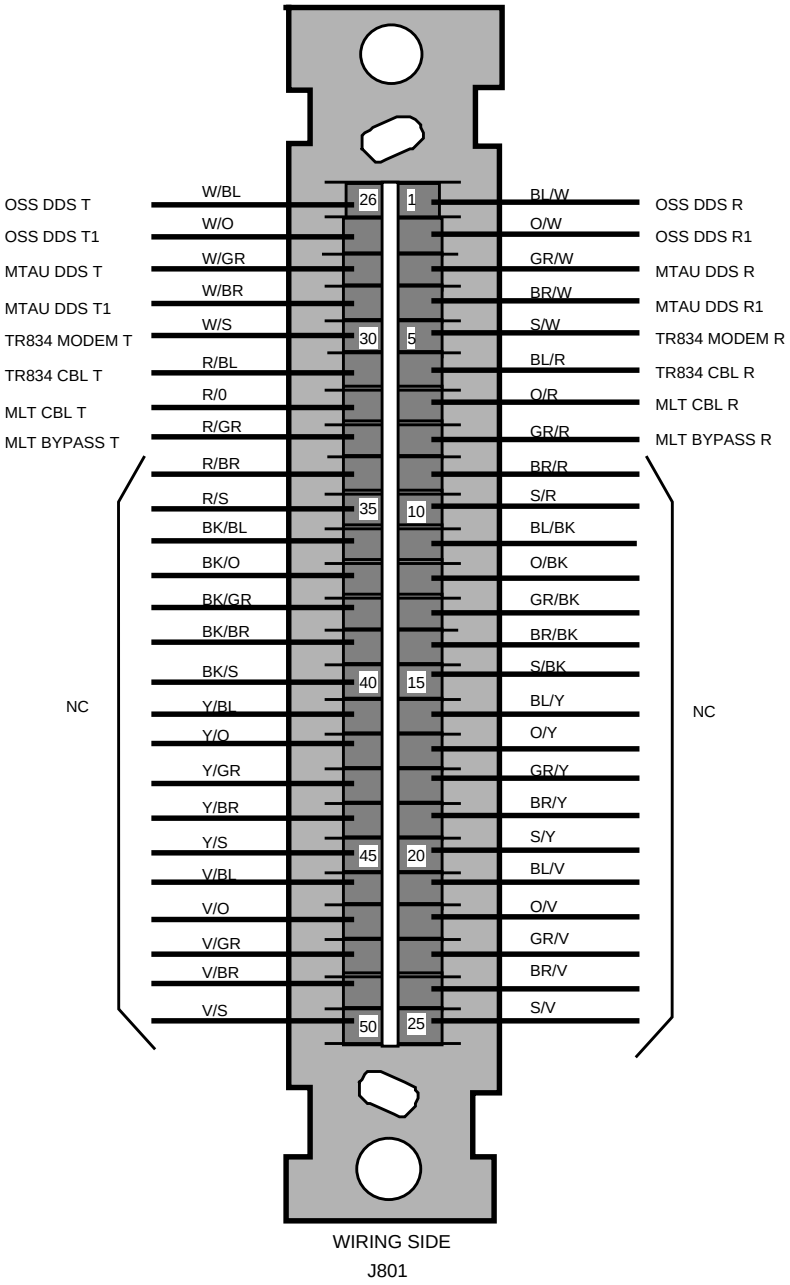


Figure 3-58. Reliance INTS Control Wiring J801

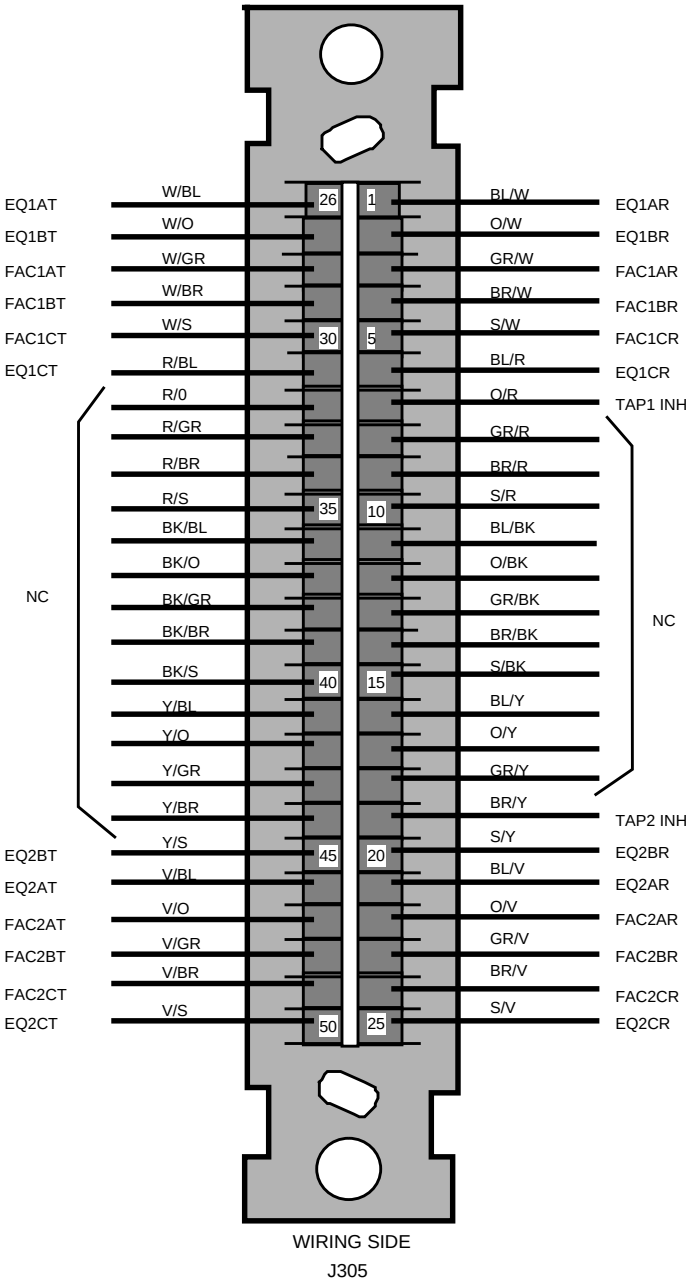


Figure 3-59. Reliance INTS TAP Wiring J305

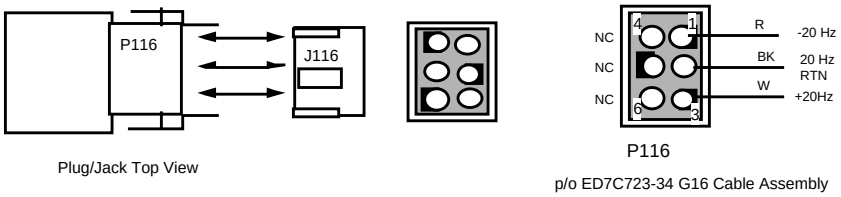


Figure 3-60. Reliance INTS Ringing Wiring P116

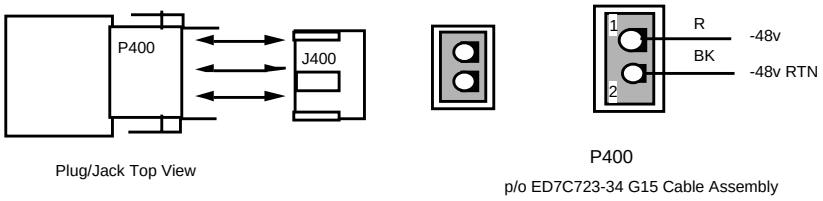


Figure 3-61. Reliance INTS Power Wiring P400

Line Test Fanout Interconnections

General

The LTF supports *4TEL* and Reliance test heads and is used only at RT sites which have multiple *SLC*-2000 RT systems. Up to 8 systems can be supported from a single remote test unit. The LTF provides the switching between the metallic by-pass pair and the measurement apparatus test bus.

The LTF is powered (via J10) from -48v dc supplied by an auxiliary fuse panel provided by the customer. The physical interface from the LTF to the remote test head is via a DB9 connector (J1) containing the metallic by-pass pair and control connections. The interface with the *SLC*-2000 systems is through eight faceplate mounted RJ-45 connectors (LTT 1-8) allowing for the connection of the communications leads and test pair from each RT system ARM shelf.

Power Cable ED7C723-34 Group 11

This cable provides the -48v/RTN connection to the Auxiliary Fuse Panel.

Step 1: Connect the leads in accordance with the associated figure for the P10 connector at an assigned fuse position for the LTF.

Step 2: Mate the P10 connector with J10 on the LTF.

Step 3: Assign the LTF fuse position with a 1 1/3 amp fuse.

4TEL RMU Control Link Cable 846823763

This cable is the control link with the *RMU*. Refer to Figure 5-8 in Chapter 5 for its wiring details.

Step 1: Mate the SWITCH/DLC connector of the cable assembly to its associated connector on the *RMU*.

Step 2: Mate the cable's P1 connector to the LTF J1 connector.

Reliance INTS Control Link Cable ED7C723-34 Group 17

This cable is the control link with the INTS system. Refer to Figure 5-6 in Chapter 5 for its wiring details.

Step 1: Mate the J44A connector of the cable assembly with the associated cable connector of the Reliance INTS shelf.

Step 2: Mate the cable's P1 connector to the LTF J1 connector.

SLC-2000 /LTF Control Link Cable VA02706-XX

This cable is the control link between each system's ARM shelf and the LTF. One cable is required for each *SLC*-2000 system at the RT site. This is not an Lucent Technologies cable assembly. Refer to Figure 5-6 in Chapter 5 for wiring details and ordering information.

Step 1: Stamp the first cable's RJ-45 connector as LTT-1 and mate with the LTT 1 connector to the LTF.

Step 2: Mate the cable's P44 connector with the ARM shelf's J44 connector which is part of the ED7C723-30 G17 dangler cable assembly on the first *SLC*-2000 RT system.

Step 3: Repeat steps 1 and 2 for each RT system 2 through 8, if necessary, each time labeling the RJ-45 connector to match the RT system number and mating to the associated LTF connector.

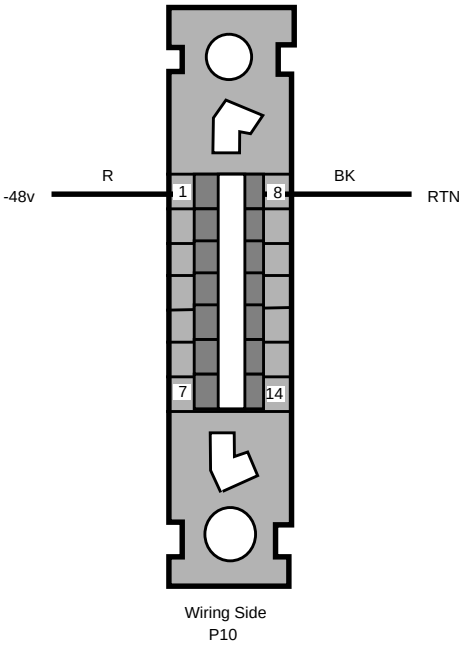


Figure 3-62. LTF Power Connections (ED7C723-34, Group 11)

Parts Lists and Kits

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Parts Lists and Kits

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General Information

This section provides general information to be used for checking the basic material and hardware necessary for the complete assembly and installation of the *SLC*®-2000 Remote Terminal. This material includes the basic *SLC*-2000 hardware and the required ancillary equipment. Circuit packs, software, and test equipment necessary for the turn-up, test and maintenance of the system are listed in those associated documents and are not included here. Complete ordering information can be found in the Engineering and Ordering Guide and the PC-based Configurator, Planning and Ordering Tool.

Basic *SLC*-2000 Hardware - Supplier Furnished	
J1C265AA-1	ARM Shelf Assembly
J1C265AB-1	MDS Shelf Assembly
J1C265AC-1	HDOS Shelf Assembly
4G	Fan Shelf
ED7C723-30	Power Interface Unit
ED7C723-34	Common Cable Assemblies
ED7C723-35	Peripheral Cable Assemblies

Ancillary Equipment - Customer Furnished
Ringing Supplies
-48 Volt DC Bulk Power Supply
VF Cross Connect Blocks
Optic Fiber Cross Connect Blocks

Ancillary Equipment - Customer Furnished
Optic Fiber Jumper Cables
Bulk Power and Ringing Cables
DS1 Cross Connect Blocks - optional
Tools
Test Equipment

Basic SLC-2000 Hardware

Factory Assembled RT Bays

- J1C265A-1 7-foot Remote Terminal Bay

Frame Mounting Material (1 per RT Frame)

Frame mounting material consists of the basic bay framework, anchoring material, and miscellaneous hardware to enclose and protect the equipment and cabling within the bay. The following listings can be used as an ordering guide or as an installation checklist for material previously ordered. The material that is indicated as optional is used to enhance the general appearance of the bay or is relevant to its particular environment.

Refer to the SUPPLEMENTARY INFORMATION chapter of this manual for detailed information.

ARM Shelf (1 per RT Frame)

- J1C265AA-1 List 1 ARM Assembly

MDS Assembly (as required)

- J1C265AB-1 List 1 MDS Assembly (0 minimum, 4 maximum)

HDOS (as required for FITL applications)

- J1C265AC-1 List 4 HDOS (0 minimum, 2 maximum)

Fan Shelf (as required)

- 4G Fan Shelf (1 per metallic systems, 2 for FITL systems)

Power Interface Unit (1 per RT Frame)

- ED7C734-30 Group 2 Power Interface Unit

Cables

ARM Shelf Dangler Cable Assemblies

ED7C723-30 Group 1	Maintenance Panel (P177/P277)
ED7C723-30 Group 2	UIP Power (E5-8/E11-14)
ED7C723-30 Group 3	UIP ESD
ED7C723-30 Group 4	UIP (P254/P257)
ED7C723-30 Group 5	UIP (P174/P214)
ED7C723-30 Group 6	Power, ringing, alarms (J303)
ED7C723-30 Group 7	TAP (P175/P275)
ED7C723-30 Group 8	Misc. Discrete Alarms (J171/P171)
ED7C723-30 Group 9	PCM MDS1/2 (P130/J500-1)
ED7C723-30 Group 10	PCM MDS 3/4 (P131/J500-2)
ED7C723-30 Group 11	PCM MDS 5/6 (P132/J500-3)
ED7C723-30 Group 12	PCM MDS 7/8 (P133/J500-4)
ED7C723-30 Group 13()*	Optional for DS1 Feeder or Distribution (J165 or J163)
ED7C723-30 Group 14()	Optional for DS1 Feeder or Distribution (J167 or J161)
ED7C723-30 Group 15()	Optional for DS1 Feeder or Distribution (J166 or J162)
ED7C723-30 Group 16()	Optional for DS1 Feeder or Distribution (J168 or J160)
ED7C723-30 Group 17	Optional for external test system (J44/P44)
ED7C723-30 Group 18	Optional for external test system (J183/P183)

* The parenthesis after the group number of the cable assembly means that there may be an alpha character after the numeric character, e.g., Group 2 or Group 2A or Group 2B.

Cable Kits (optional)

ED7C723-31 Group 1	DS1 Distribution (1 per ARM) (discontinued availability)
ED7C723-31 Group 2()	DS1 Distribution or Metallic Feeder (replaces Group 1) includes ED7C723-30 Group 13A to 16A cable assemblies
ED7C723-31 Group 3	E&M Signaling (1 per MDS) includes ED7C723-32 Group 12 to 15 cable assemblies
ED7C723-31 Group 4	External Test Head Equipment includes ED7C723-30 Group 17 and 18 cable assemblies

MDS Dangler Cable Assemblies

ED7C723-32 Group 1	Power (J302)
ED7C723-32 Group 2	VF (J101/P101)
ED7C723-32 Group 3	VF (J102/P102)
ED7C723-32 Group 4	VF (J103/P103)
ED7C723-32 Group 5	VF (J104/P104)
ED7C723-32 Group 6	VF (J201/P201)
ED7C723-32 Group 7	VF (J202/P202)
ED7C723-32 Group 8	VF (J203/P203)
ED7C723-32 Group 9	VF (J204/P204)
ED7C723-32 Group 10	TAP (P301/P501)
ED7C723-32 Group 11()	PCM (P500/P500)
ED7C723-32 Group 12	E&M (J105/P105)
ED7C723-32 Group 13	E&M (J106/P106)
ED7C723-32 Group 14	E&M (J205/P205)
ED7C723-32 Group 15	E&M (J206/P206)

Bay Common Cables (1 per RT Frame)

ED7C723-34 Group 1	Intershelf TAP Cable Assembly
ED7C723-34 Group 2()	Power cable (part of ED7C734-30 PIU)
ED7C723-34 Group 3	Fan Power Extender Cable (discontinued availability)

Bay Common Cables (as required for FITL application)

ED7C723-34 Group 4	Transmission Cable Assembly (1 minimum, 8 maximum)
ED7C723-34 Group 5	Fan and HDOS Power Extender Cable Assembly
ED7C723-34 Group 6	Transmission Cable (replaces Group 4)

Bay Common Cables (as required for MDS/DSX-1 application)

ED7C723-35 Group 17	Transmission Cable Assembly (1 minimum, 8 maximum)
ED7C723-35 Group 18	Transmission Cable Assembly (1 minimum, 4 maximum)

Bay Common Cables (as required for remote test applications)

ED7C723-34 Group 7	(not assigned)
ED7C723-34 Group 8	(not assigned)
ED7C723-34 Group 9	RS232 link for *4TEL RMU**
ED7C723-34 Group 10	Power Interconnect for *4TEL RMU*
ED7C723-34 Group 11	Power Interconnect for Auxiliary Fuse Panel to LTF
ED7C723-34 Group 12	(Cabinet applications only- RS232 Link LTF to INTS)
ED7C723-34 Group 13	VF Pairs Multiple
ED7C723-34 Group 14	TAP Bus Multiple
ED7C723-34 Group 15	INTS Power from Auxiliary Fuse Panel
ED7C723-34 Group 16	INTS Ringing from Auxiliary Fuse Panel
ED7C723-34 Group 17	INTS to LTF Control Link

* 4TEL and RMU are registered trademarks of Teradyne, Inc.

Peripheral Cables (as required)

ED7C723-35 Group 19	30 Feet	Transmission Cable Assembly (2 cables are required for each ED7C723-35 Group 17 furnished)
ED7C723-35 Group 20	50 Feet	
ED7C723-35 Group 21	100 Feet	
ED7C723-35 Group 22	200 Feet	

Special Applications Cables

84682376	*4TEL* to LTF
VA02706-XX†	LTF to ARM
	DSX-1 Metallic Feeder (A12BS2T-50 SGL) (2 required per MDS)

† This cable can be obtained from Freedom Electronics, Inc., Cliffwood, N. J. in varying lengths to be specified (XX).

Ancillary Equipment

Ringing Supplies

- Ringing Supply shelf equipped with two +20 Hz/-20 Hz, 100 VAC Ringing Supplies (Lucent Technologies J1C182BC or equivalent)

DC Power Supply

- Two sources of -48vdc each protected by 30 amp circuit breaker

Cross-connect Blocks

VF	100 pair blocks (2 required per MDS Assembly)
DS1	Optional blocks to terminate 28 shielded pairs each, transmit and receive
Fiber Optic	Block to terminate up to 8 (metallic distribution applications) or up to 40 single-mode fibers (fiber distribution - HDOS systems)

Miscellaneous Cables

Power	< 30 feet:	Two 10-gauge pairs
	> 30 feet:	Two pairs gauged to limit D.C. drop to 1.5v maximum at 25 amps spliced down to 10 gauge before connecting to ARM shelf Power Interface Unit.
Ground	No. 2 AWG ground wire or equivalent to meet local building standards	
Fiber Optic	One pair, single-mode fiber cables per *SLC*-2000 OLIU circuit pack One single, single-mode fiber cable per HDOS OU circuit pack	
Ringing	Two 20-gauge twisted triples	

Tools

Basic	Hand tool kit (screwdrivers, wrenches, pliers, etc.) Large tool kit (hammers, claw bar, level, etc.) Floor drilling equipment (roto-hammer, masonry bits) drop-in anchors may be furnished by supplier Lifting equipment (hoists, dolly trucks, straps, etc.)
Special	Wire wrap tools (gun, bits for 22, 24, and 26 gauges) Cable crimpers (battery and ground lugs) TY-RAP* tool
Test Equipment	Digital volt/ohmmeter

* Registered trademark of Thomas & Betts, Corp

Parts Description

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Parts Description

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General Information

This section details the major components of the various shelves and assemblies. Specific information is provided for the structure of each assembly describing which components are factory equipped and which are shipped separately. This information on the following assemblies can be used as a checklist and for ordering missing hardware and sub-units necessary for the complete assembly and installation of the *SLC*®-2000 Remote Terminal.

- Frame details
- Installation material
- ARM shelf parts
- MDS assembly parts
- HDOS assembly parts
- Cable assemblies

Frame Hardware

Frame Details and Installation Material

Refer to the SUPPLEMENTARY INFORMATION chapter of this manual for detailed information.

Shelf Equipment

ARM Shelf Parts

The ARM shelf is provided by the manufacturer with the following individual cable assemblies and hardware. The following listings can be used as an ordering guide or as an installation checklist for material previously ordered. The material that is indicated as optional is required for specific purposes. All pieces are shipped with the shelf, but some parts (*) may be loosely attached or shipped in separate containers.

J1C265AA-1 List 1 ARM Shelf Assembly
equipped with

ED7C723-30 Group 1	Cable Assembly
ED7C723-30 Group 2	Cable Assembly
ED7C723-30 Group 3	Cable Assembly
ED7C723-30 Group 4	Cable Assembly
ED7C723-30 Group 5	Cable Assembly
ED7C723-30 Group 6	Cable Assembly
ED7C723-30 Group 7	Cable Assembly
ED7C723-30 Group 8	Cable Assembly
ED7C723-30 Group 9()**	Cable Assembly
ED7C723-30 Group 10()	Cable Assembly
ED7C723-30 Group 11()	Cable Assembly
ED7C723-30 Group 12()	Cable Assembly
(6) 801486341*	Screws, special round head
(2) 402444491*	Studs, slotted
(2) 846944411*	Labels, system identification
(1) 406203182*	Fuse, 0.5 amp
(1) 406421032*	Fuse, 2.0 amp
(2) 406203190*	Fuses, 10 amp

** The parenthesis after the group number of the cable assembly means that there may be an alpha character after the numeric character, e.g., Group 2 or Group 2A or Group 2B.

ED7C723-31 Group 2() DS1 Distribution /Feeder Cable Kit (OPTIONAL) consisting of:

ED7C723-30 Group 13()	Cable Assembly
ED7C723-30 Group 14()	Cable Assembly
ED7C723-30 Group 15()	Cable Assembly
ED7C723-30 Group 16()	Cable Assembly

MDS Assembly Parts

The MDS assembly is provided by the manufacturer with the following individual cable assemblies and hardware. The following listing can be used as an ordering guide or as an installation checklist for material previously ordered. The material that is indicated as optional is required for specific purposes. All pieces are shipped with the shelf, but some parts (*) may be loosely attached or shipped in separate containers.

J1C265AB-1 List 1 MDS Assembly
equipped with

ED7C723-32 Group 1	Cable Assembly
ED7C723-32 Group 2	Cable Assembly
ED7C723-32 Group 3	Cable Assembly
ED7C723-32 Group 4	Cable Assembly
ED7C723-32 Group 5	Cable Assembly
ED7C723-32 Group 6	Cable Assembly
ED7C723-32 Group 7	Cable Assembly
ED7C723-32 Group 8	Cable Assembly
ED7C723-32 Group 9	Cable Assembly
ED7C723-32 Group 10	Cable Assembly
ED7C723-32 Group 11()	Cable Assembly
(6) 801486341*	Screws, special round head
(2) 402444491*	Studs, slotted
(2) 846944411*	Labels, system identification
(2) 406203182*	Fuses, 0.5 amp
(4) 406203976*	Fuses, 5.0 amp

Power Interface Unit Parts

The Power Interface Unit is provided by the manufacturer with the following cable assembly and hardware. The following listing can be used as an ordering guide or as an installation checklist for material previously ordered. The cable assembly is shipped with the unit.

ED7C734-30 Group 1 Power Interface Unit
equipped with

ED7C723-34 Group 2	Cable Assembly

NOTE:
The following cable assembly is required in addition to the above for the FITL option:

ED7C723-34 Group 5	Fan and HDOS Power Extender Cable Assembly

HDOS Assembly Parts

The HDOS assembly is provided by the manufacturer with the following hardware. The following listing can be used as an ordering guide or as an installation checklist for material previously ordered. The material that is indicated as optional is required for specific purposes. All pieces are shipped with the shelf, but some parts (*) may be loosely attached or shipped in separate containers.

J1C265AC-1 List 4 HDOS Assembly
equipped with

(4) 840060164*	Screws, pan head machine
(2) 402444491*	Studs, slotted
(1) 846240133*	Cover, fiber
(10) 406432989*	Fuses, 1.0 amp

Cable Assemblies

The major cable assemblies furnished as dangler cables on the ARM and MDS are attached to those shelves by the manufacturer. The following cable assemblies interface with the customer's cables. Because they are not depicted in the CABLING, WIRING AND ASSEMBLY chapter of this manual they are detailed here for installation trouble shooting purposes.

Refer to the following figures for wiring details.

5-1	ED7C723-30 Group 7	TAP to ARM backplane interface
5-2	ED7C723-30 Group 8	Misc. Discrete Alarm to ARM backplane interface
5-3	ED7C723-30 Group 13()	DS1 to ARM backplane interface
5-3	ED7C723-30 Group 14()	DS1 to ARM backplane interface
5-3	ED7C723-30 Group 15()	DS1 to ARM backplane interface
5-3	ED7C723-30 Group 16()	DS1 to ARM backplane interface
5-6	ED7C723-30 Group 17	RS232 to ARM backplane interface
5-7	ED7C723-30 Group 18	CIT to ARM backplane interface
5-4	ED7C723-32 Group 2	VF to MDS backplane interface
5-4	ED7C723-32 Group 3	VF to MDS backplane interface
5-4	ED7C723-32 Group 4	VF to MDS backplane interface
5-4	ED7C723-32 Group 5	VF to MDS backplane interface
5-4	ED7C723-32 Group 6	VF to MDS backplane interface
5-4	ED7C723-32 Group 7	VF to MDS backplane interface
5-4	ED7C723-32 Group 8	VF to MDS backplane interface
5-4	ED7C723-32 Group 9	VF to MDS backplane interface
5-5	ED7C723-32 Group 10	TAP to MDS backplane interface
5-5	ED7C723-32 Group 11()	PCM Distribution to MDS backplane interface
N/A	ED7C723-34 Group 5	Fan and HDOS Power Extender
N/A	ED7C723-34 Group 6	HDOS to MDS Transmission Interface
5-8	ED7C723-34 Group 9	RS232 Link to RMU
5-9	ED7C723-34 Group 13	VF Pairs Multiple
5-10	ED7C723-34 Group 14	TAP Bus Multiple
5-11	ED7C723-34 Group 17	LTF to INTS Control Link
5-12	ED7C723-35 Group 17	DSX-1 to MDS Transmission Interface
5-13	ED7C723-35 Group 18	DSX-1 to HDOS Transmission Interface
5-14	ED7C723-35 Group 19 - 22	DSX-1 to MDS Transmission Interface

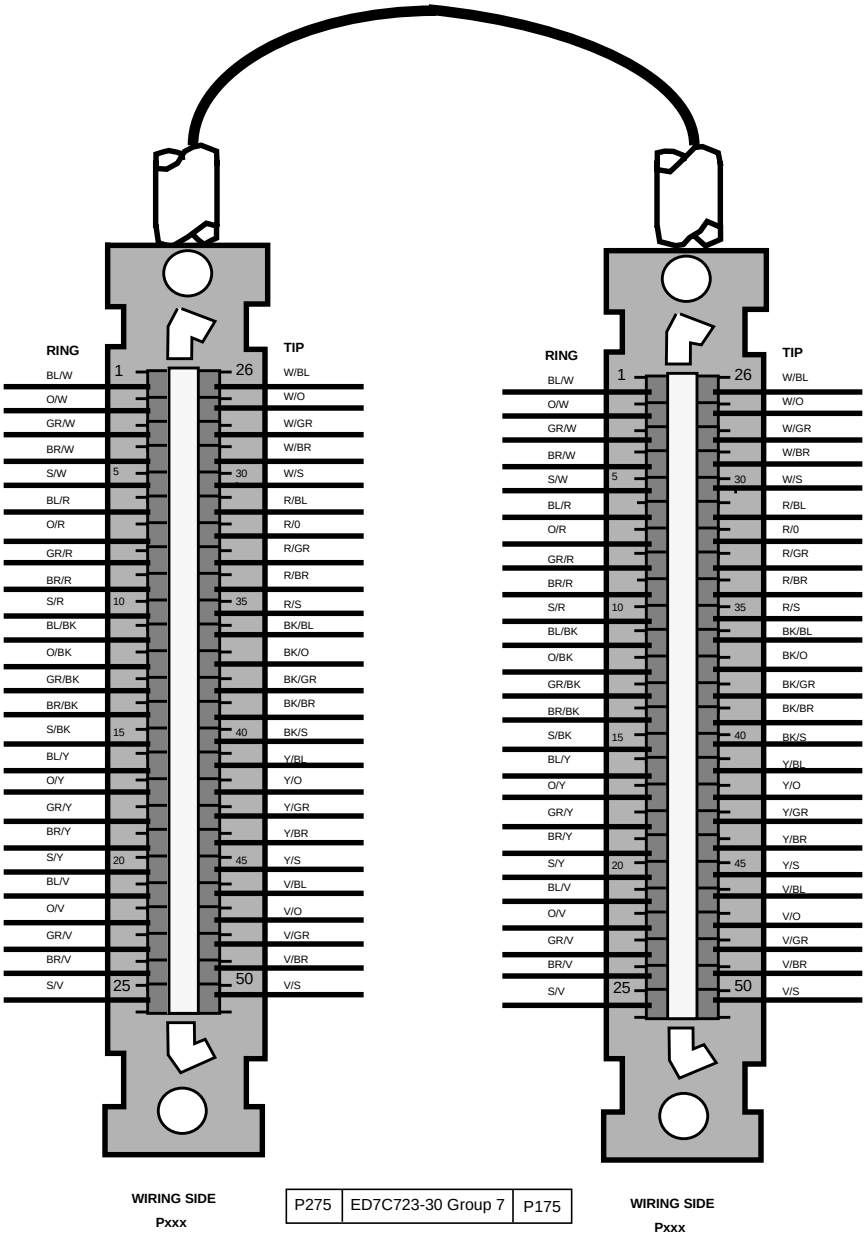


Figure 5-1. Cable Assembly ED7C723-30 Group 7

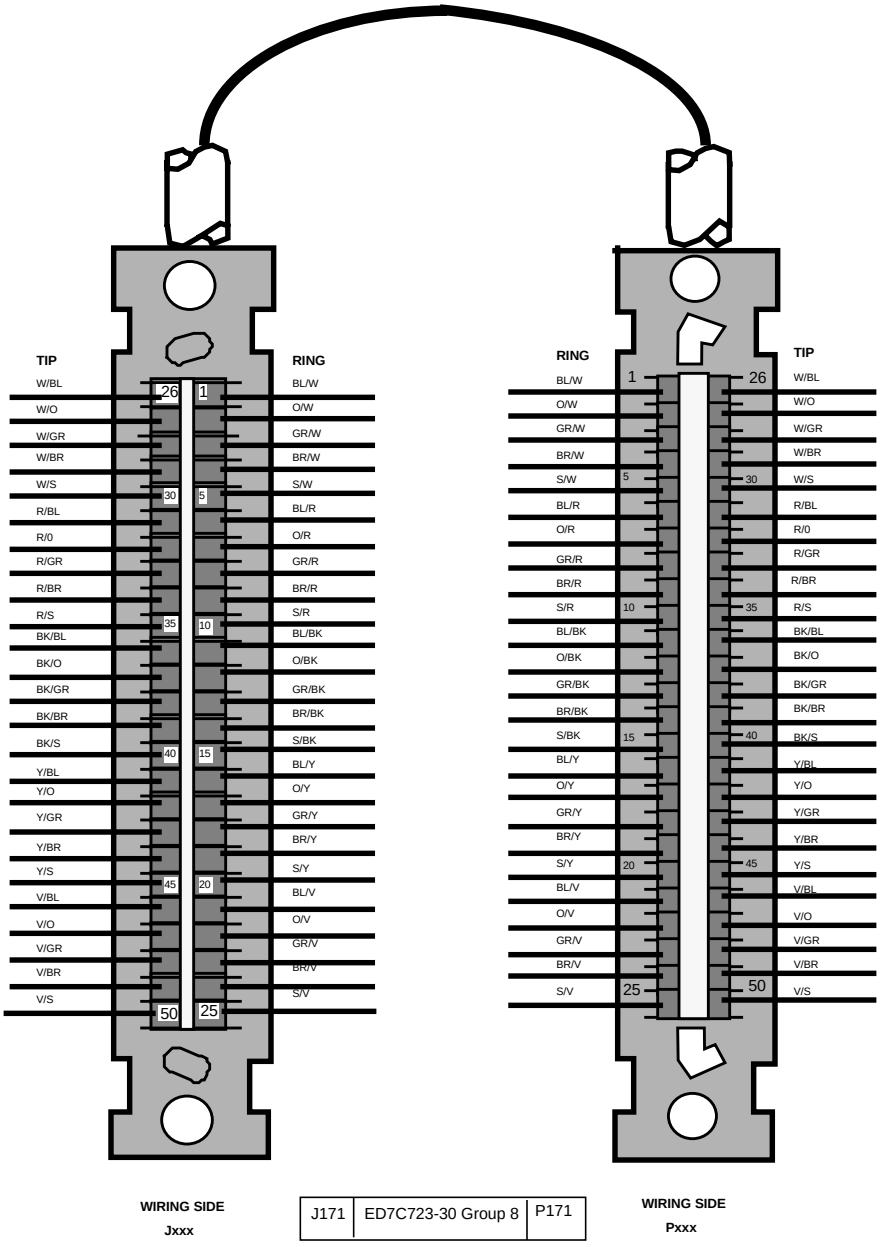
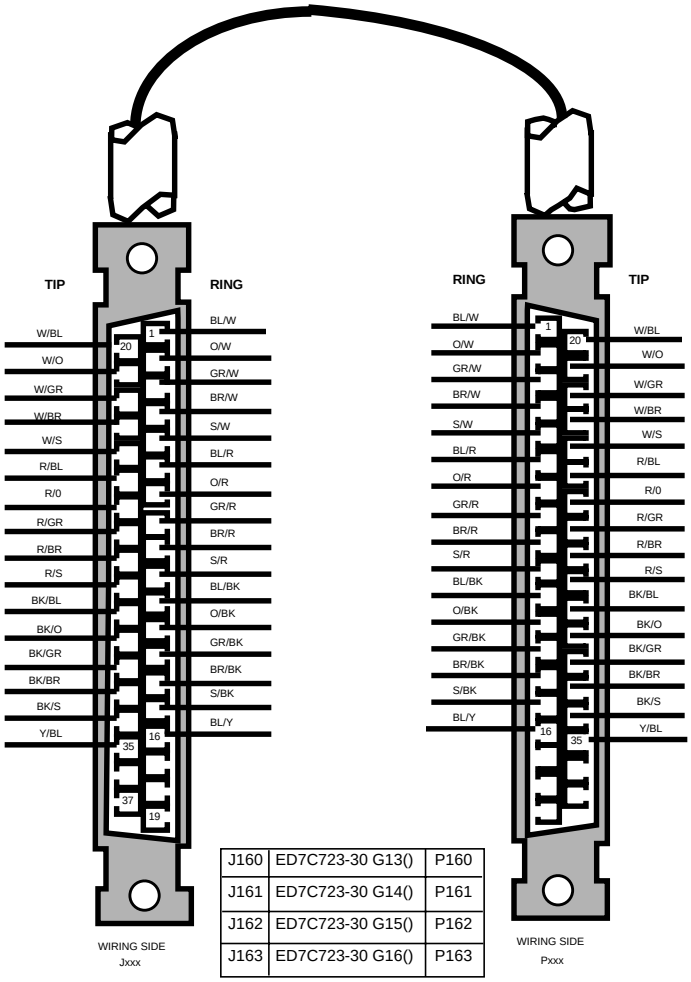
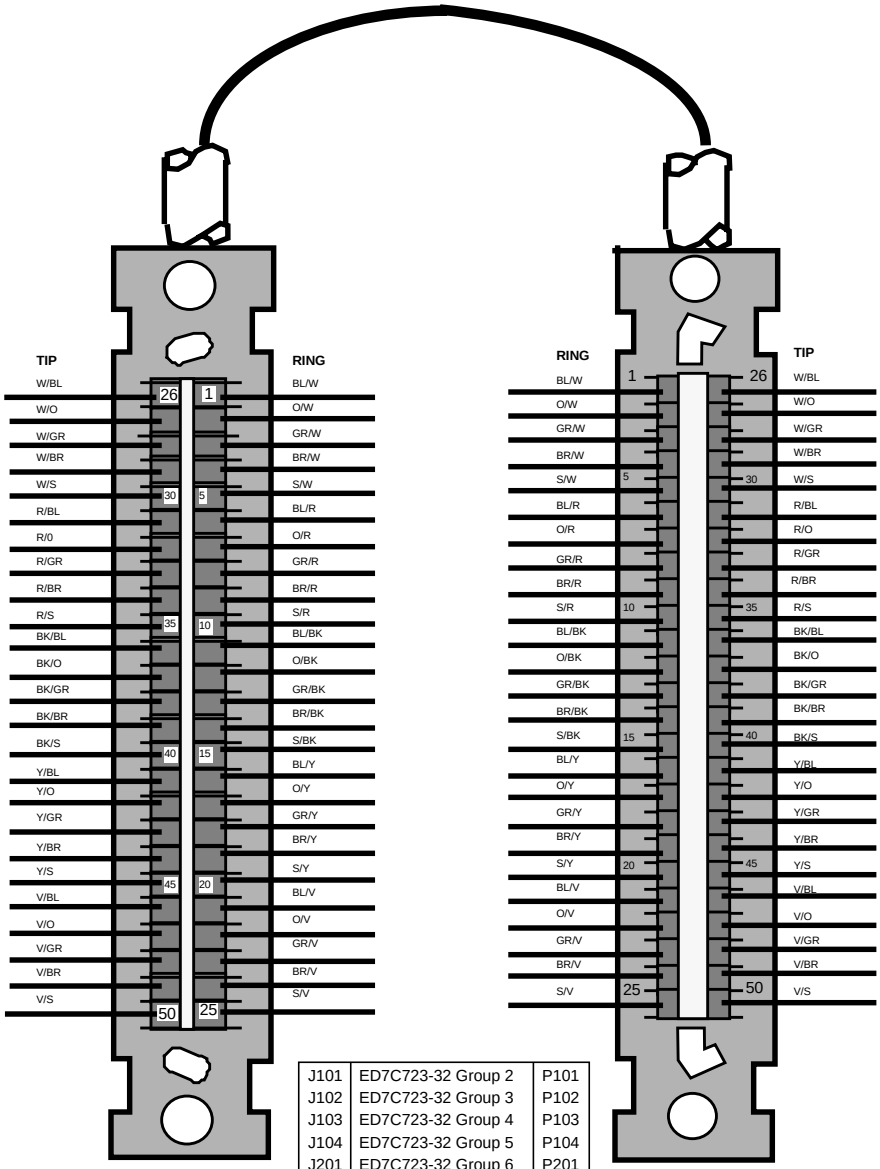


Figure 5-2. Cable Assembly ED7C723-30 Group 8



J160	ED7C723-30 G13()	P160
J161	ED7C723-30 G14()	P161
J162	ED7C723-30 G15()	P162
J163	ED7C723-30 G16()	P163

Figure 5-3. Cable Assembly ED7C723-30 Groups 13() through 16()



J101	ED7C723-32 Group 2	P101
J102	ED7C723-32 Group 3	P102
J103	ED7C723-32 Group 4	P103
J104	ED7C723-32 Group 5	P104
J201	ED7C723-32 Group 6	P201
J202	ED7C723-32 Group 7	P202
J203	ED7C723-32 Group 8	P203
J204	ED7C723-32 Group 9	P204
J105	ED7C723-32 Group 12	P105
J106	ED7C723-32 Group 13	P106
J205	ED7C723-32 Group 14	P205
J206	ED7C723-32 Group 15	P206

Figure 5-4. Cable Assembly ED7C723-32 Groups 2 through 9 & 12 through 15

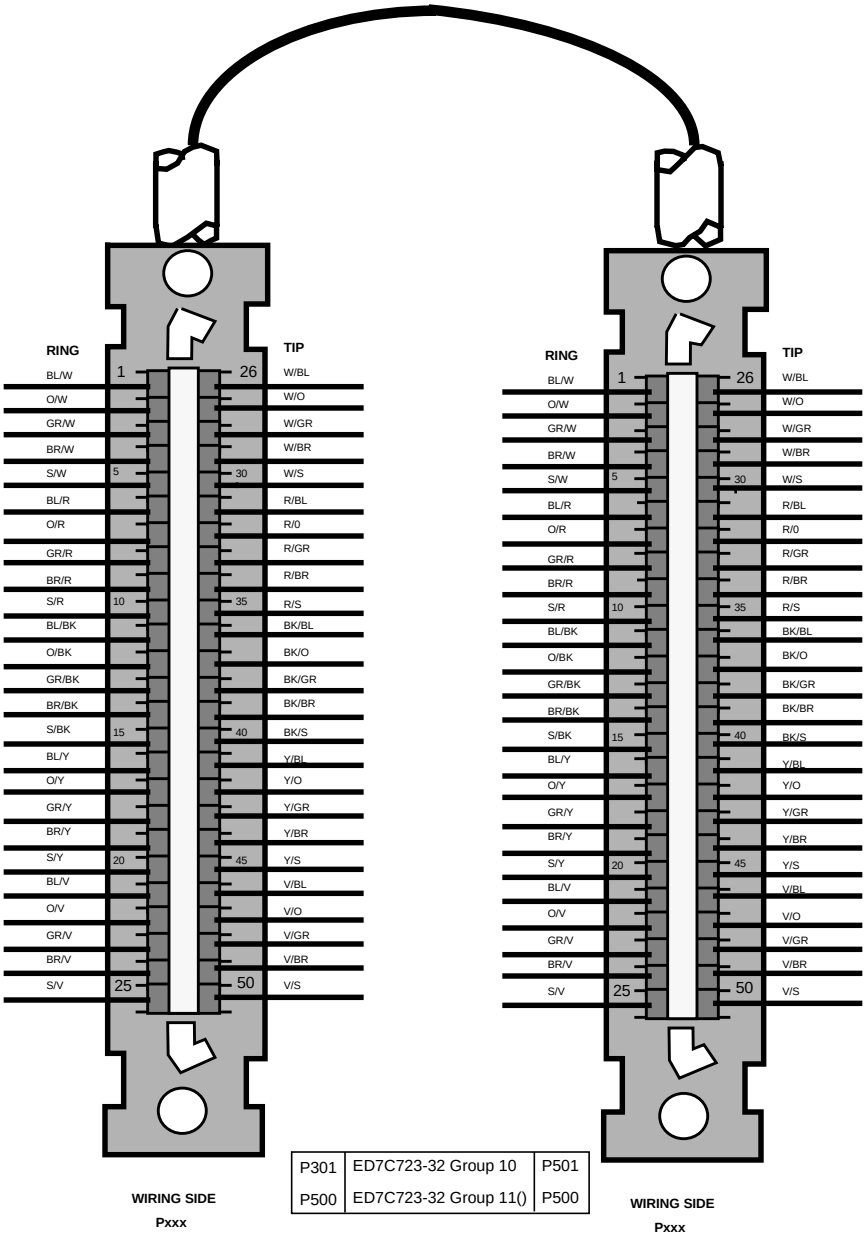


Figure 5-5. Cable Assembly ED7C723-32 Groups 10 and 11()

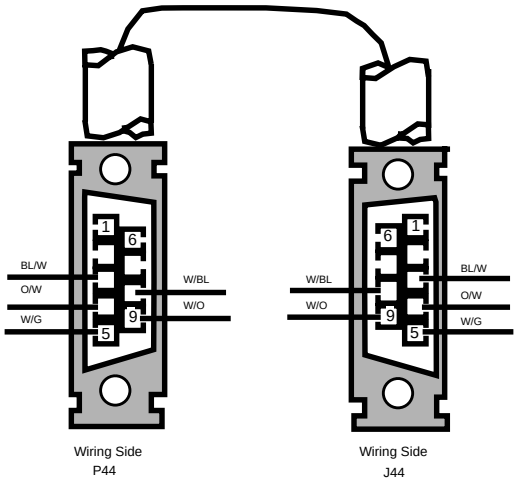


Figure 5-6. Cable Assembly ED7C723-30 Group 17

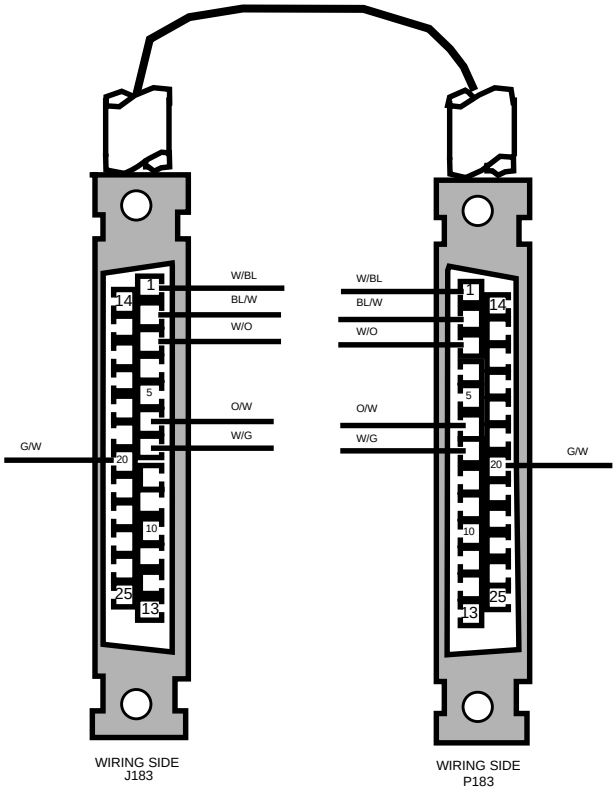


Figure 5-7. Cable Assembly ED7C723-30 Group 18

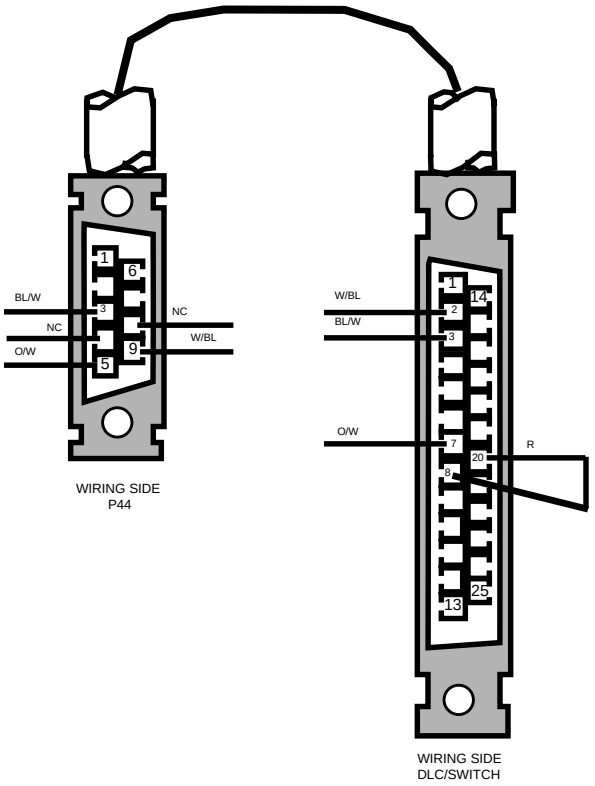


Figure 5-8. Cable Assembly ED7C723-34 Group 9

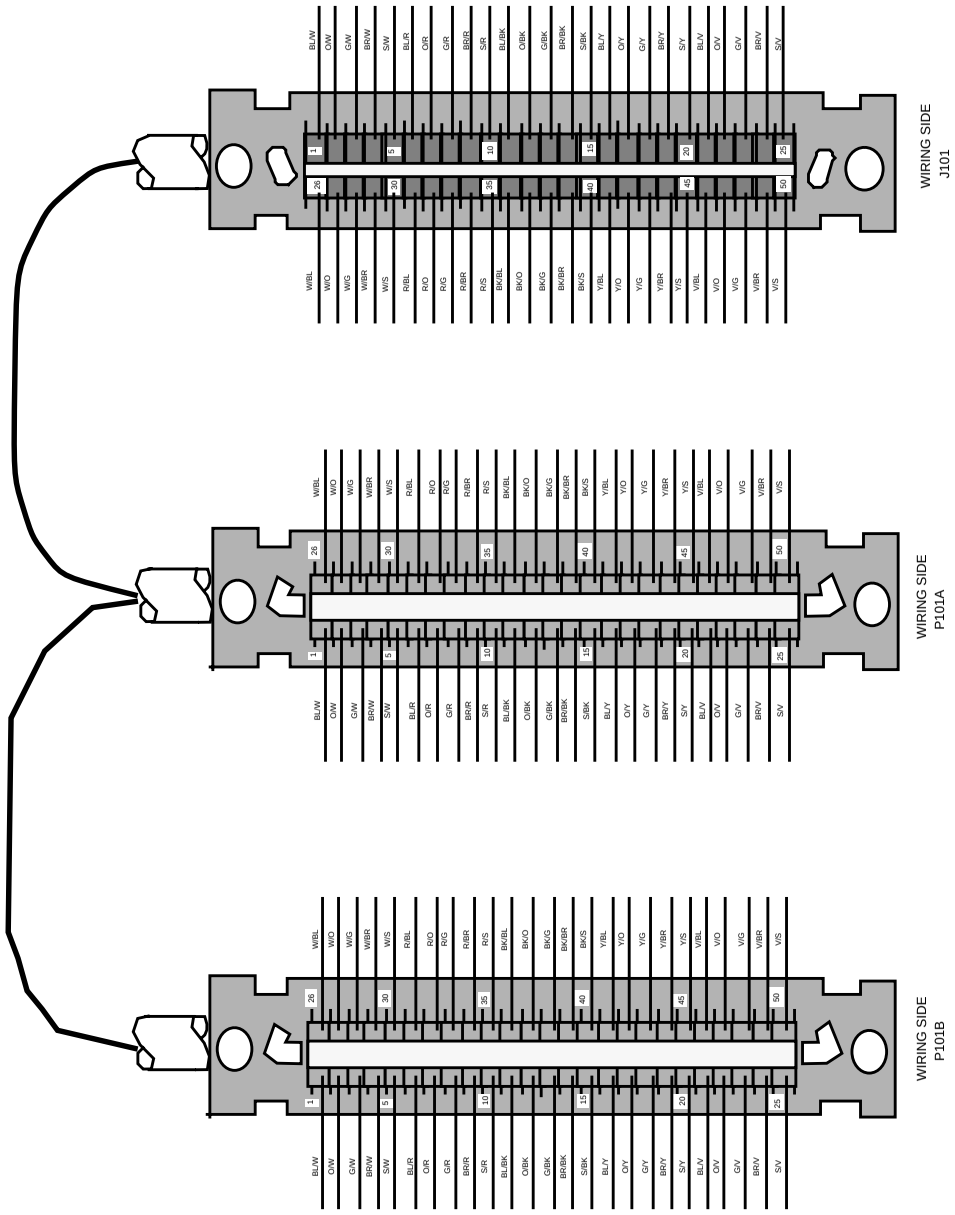


Figure 5-9. Cable Assembly ED7C723-34 Group 13

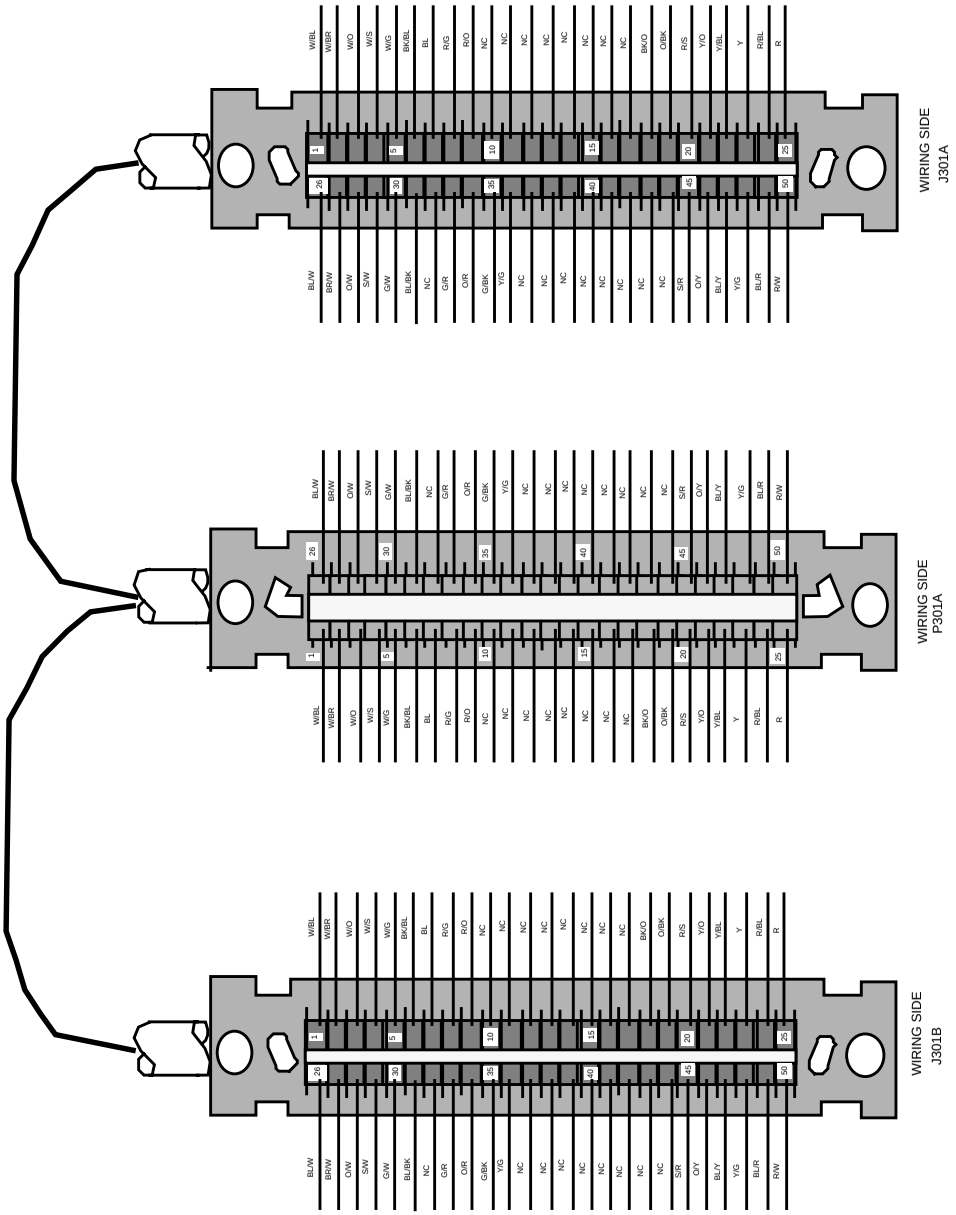


Figure 5-10. Cable Assembly ED7C723-34 Group 14

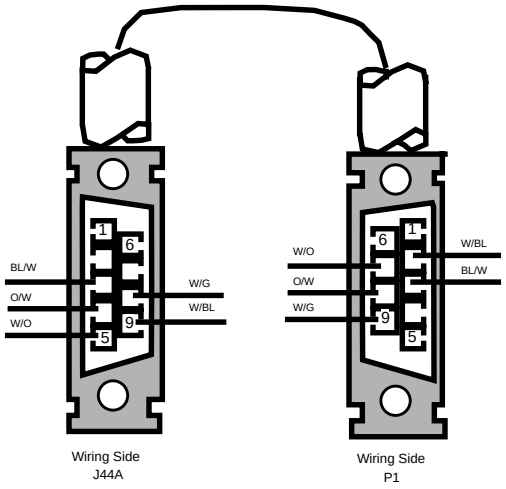


Figure 5-11. Cable Assembly ED7C723-34 Group 17

Note: The wiring for J101/J201, J102/J202, J103/J203, and J104/J204 is shown below and the wiring for P191/P192 OUT and P191/P192 IN is shown on the next page.

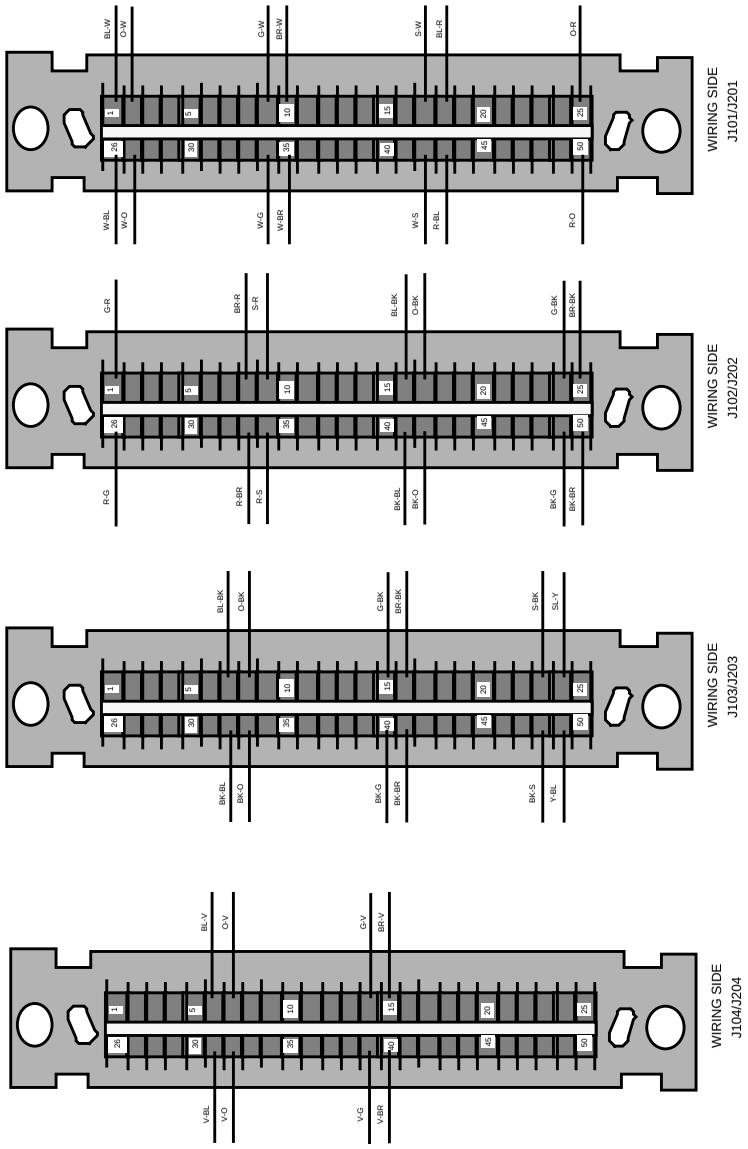
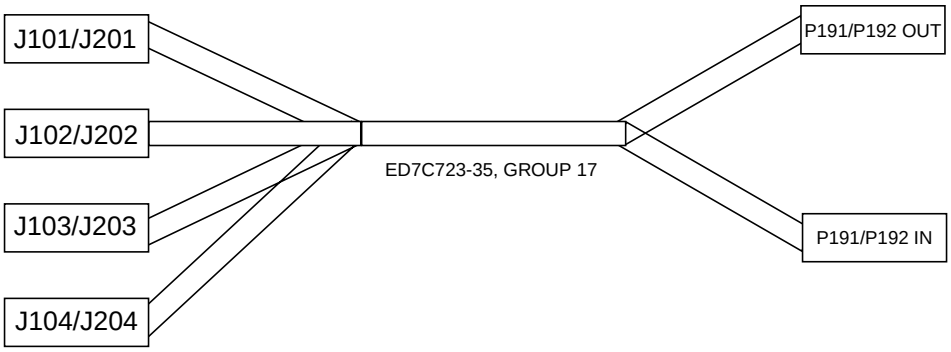
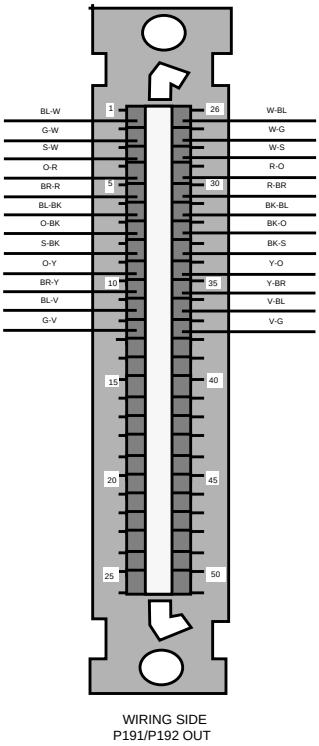


Figure 5-12. Cable Assembly ED7C723-35 Group 17



Note: The wiring for J101/J201, J102/J202, J103/J203 and J104/J204 is shown on the previous page and the wiring for P191/P192 OUT and P191/P192 IN is shown below.



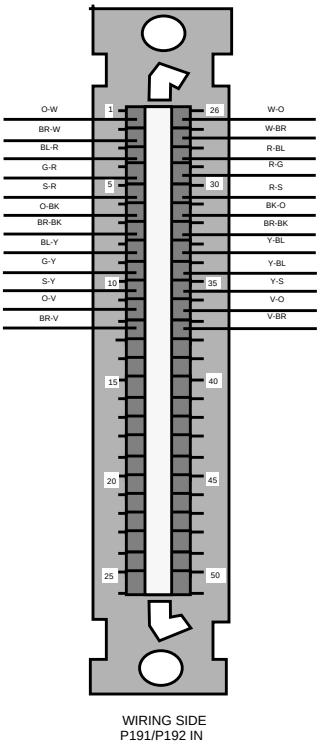


Figure 5-12. (Cont.)Cable Assembly ED7C723-35 Group 17 (Continued)

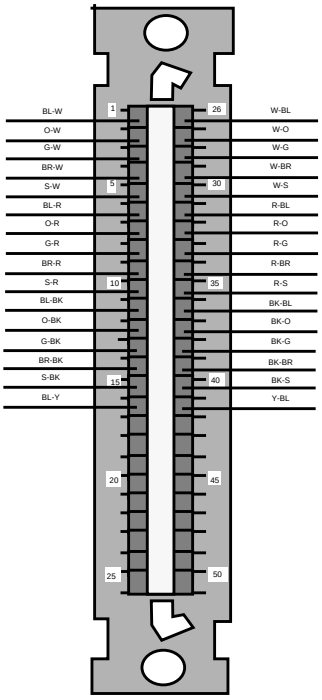
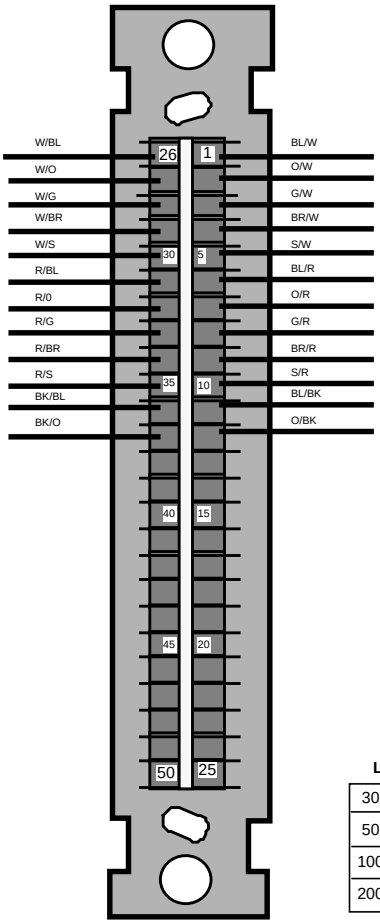


Figure 5-13. Cable Assembly ED7C723-35 Group 18



Length	Cable Assembly	Comcode #
30.0 Feet	ED7C723-35 G19	601845472
50.0 Feet	ED7C723-35 G20	601845480
100.0 Feet	ED7C723-35 G21	601845498
200.0 Feet	ED7C723-35 G22	601845506

Figure 5-14. Cable Assembly ED7C723-35 Groups 19 through 22

Applications

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A

Introduction

This section of the manual contains Application Figures and the standard Application Schematic drawing. These drawings facilitate the installation process and are a means of tracing and troubleshooting installation wiring and interconnect problems. They offer the installer both a comprehensive overview and detailed requirements relating to all interconnections in the *SLC*®-2000 RT Frame System.

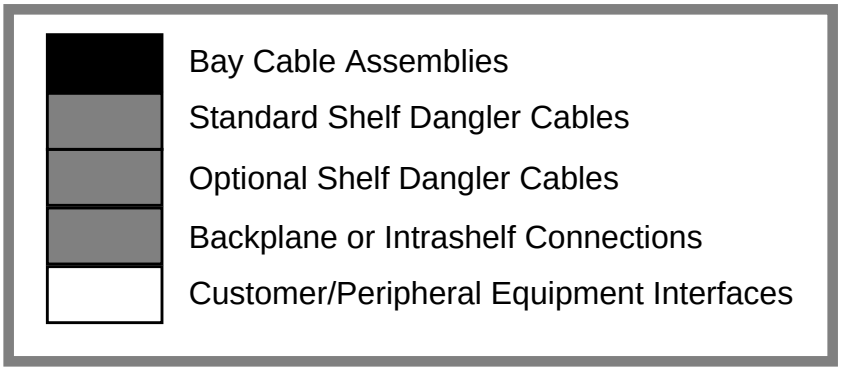
Application Figures

These general figures are meant to guide the installer in the installation of the Customer Interconnect Cable Assemblies and the cross-connections to the ancillary, auxiliary, and/or external equipment. Separate cross-connect blocks are indicated for each type of alarm and test application (Miscellaneous, Discrete, RT, DC Test Pair, etc.) but may be economically combined at the customer's discretion. The figures show specific equipment (cable assemblies, cross-connect blocks, ringing supplies, etc.) but are meant to be typical examples. Other vendor products may be substituted but they must meet the requirements outlined by the Application Schematic, SD7C174-01.

Figure A-8:	Power and Ringing Interconnect
Figure A-9:	DC Access Pair
Figure A-10:	*4TEL RMU* Cross-connections
Figure A-11:	Reliance INTS Cross-connections

Peripheral Equipment Interconnections

Figure A-1A represents the major peripheral equipment connections from the *SLC*-2000 RT Bay, Metallic Distribution application, as well as all inter-shelf installation cables. Refer also to Figure A-1B for detailed RT Bay, FITL application, interconnections. Cable assemblies are represented by the following legend:



Bay cable assemblies:	Local inter-shelf cables shipped separately with the RT bay equipment but not associated with a particular shelf.
Standard shelf dangler:	Cables shipped as part of the associated shelf.
Optional shelf dangler:	Cables shipped with the shelf for a particular application.
Backplane connection:	Associated shelf connectors for cable connections.
Customer interfaces:	Cable assemblies for connecting peripheral equipment

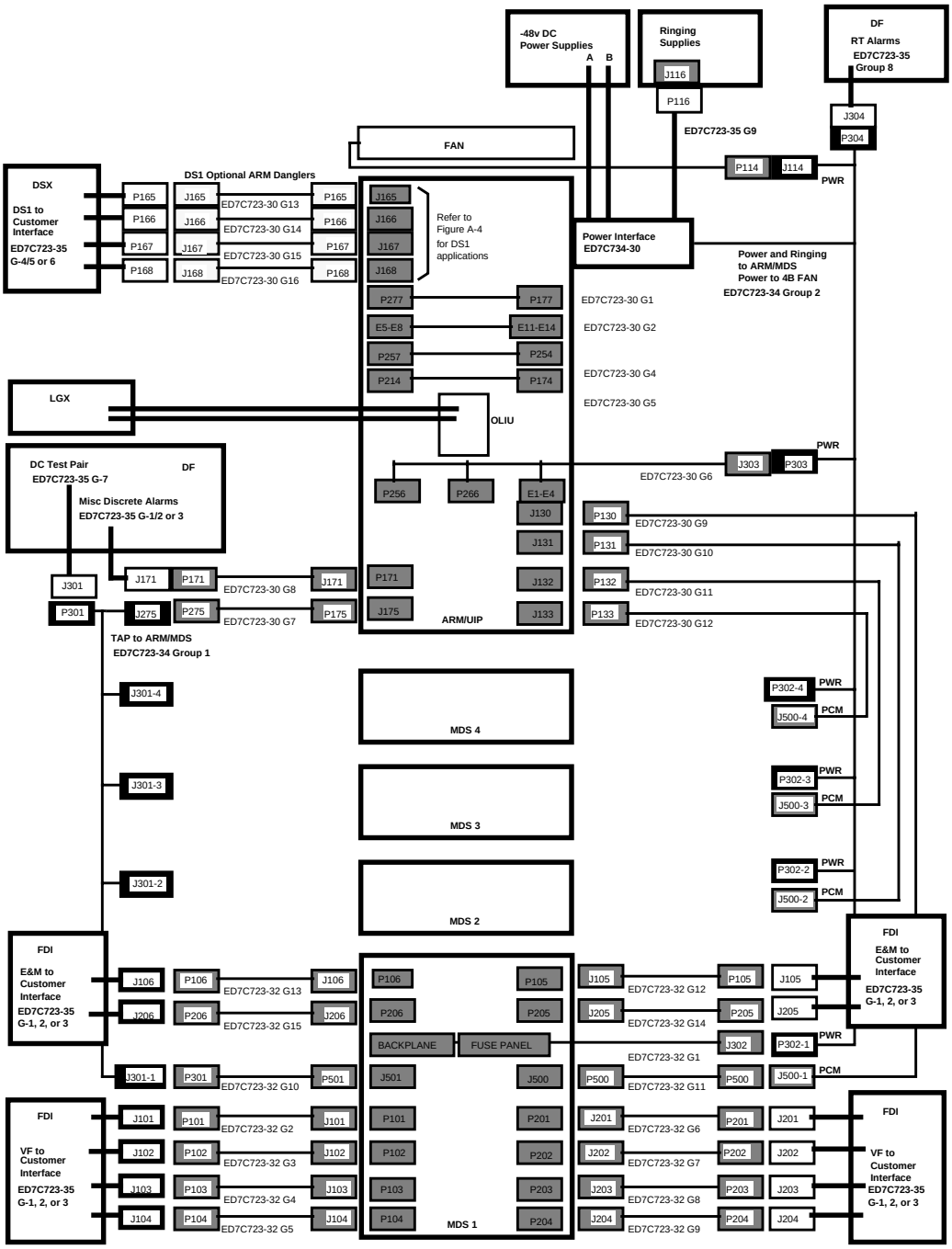


Figure A-1A. RT Bay Metallic Application Peripheral Interconnections

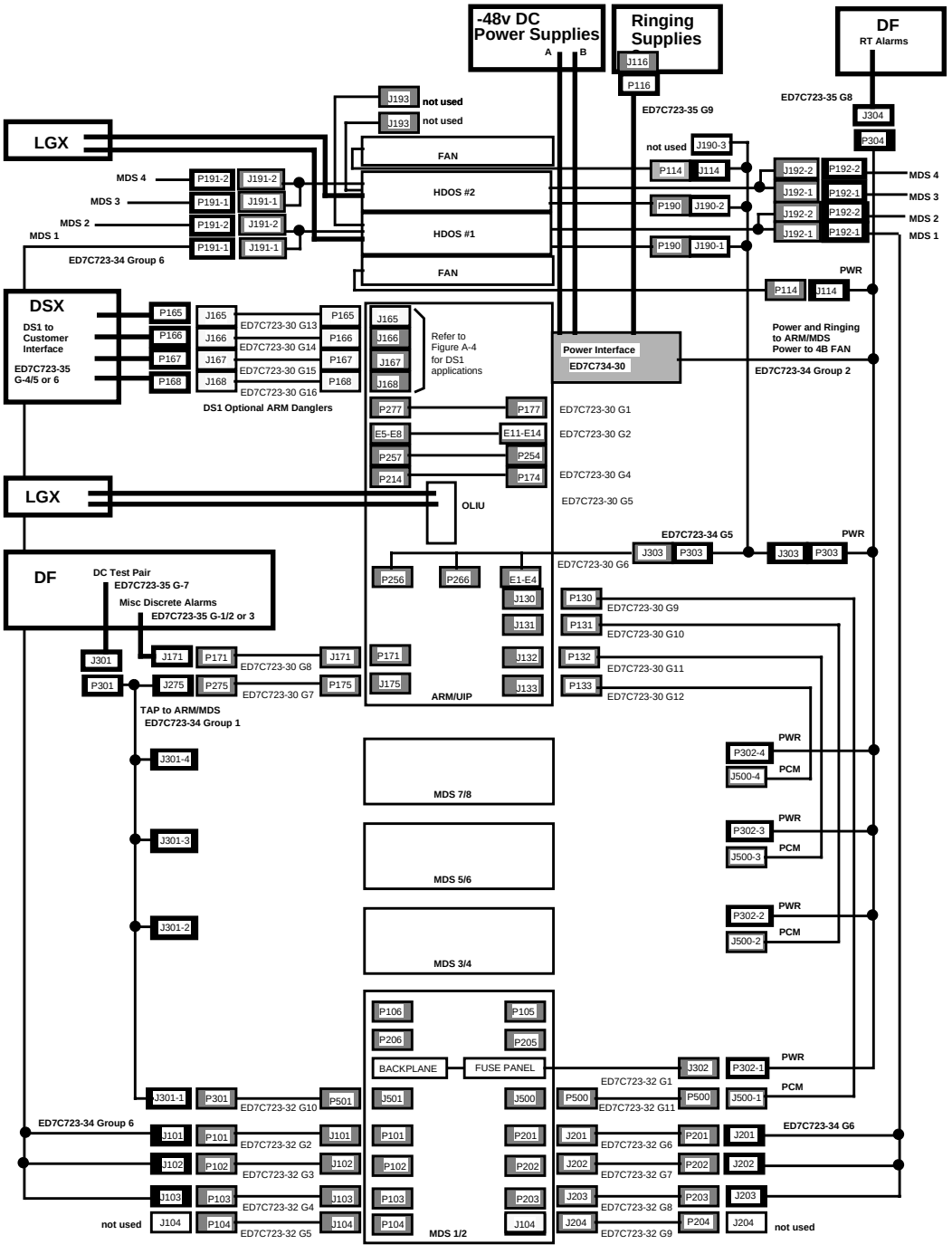


Figure A-1B. RT Bay FITL Application Peripheral Interconnections

VF Interconnections

Circuit Numbering

VF channel numbering is from 1 to 96 at each of the eight MDS shelves (4 MDS Assemblies). Derived pair numbering for the outside plant (OSP) cables at the MDF is in blocks of 100 pairs with the following association for the possible 768 channels.

Table A-1. D OSP Cable Pair/ MDS VF Channel Numbering

OSP	MDS		
Cable Pair	Shelf	Channel	Connector
001-096	1	1-96	J101-J104
101-196	2	1-96	J201-J204
201-296	3	1-96	J101-J104
301-396	4	1-96	J201-J204
401-496	5	1-96	J101-J104
501-596	6	1-96	J201-J204
601-696	7	1-96	J101-J104
701-796	8	1-96	J201-J204

Protector Blocks

UL approved installations require a protected wire system which consists of Lucent Technologies Protectors on all outside plant telecommunications circuits. Lucent Technologies standard circuit 4C1E-W (black) or special circuit 4C3E-W (red) protectors and building entrance cable shall be located as specified in Article 800-2 of the National Electric Code, ANSI/MFPA number 70-87.

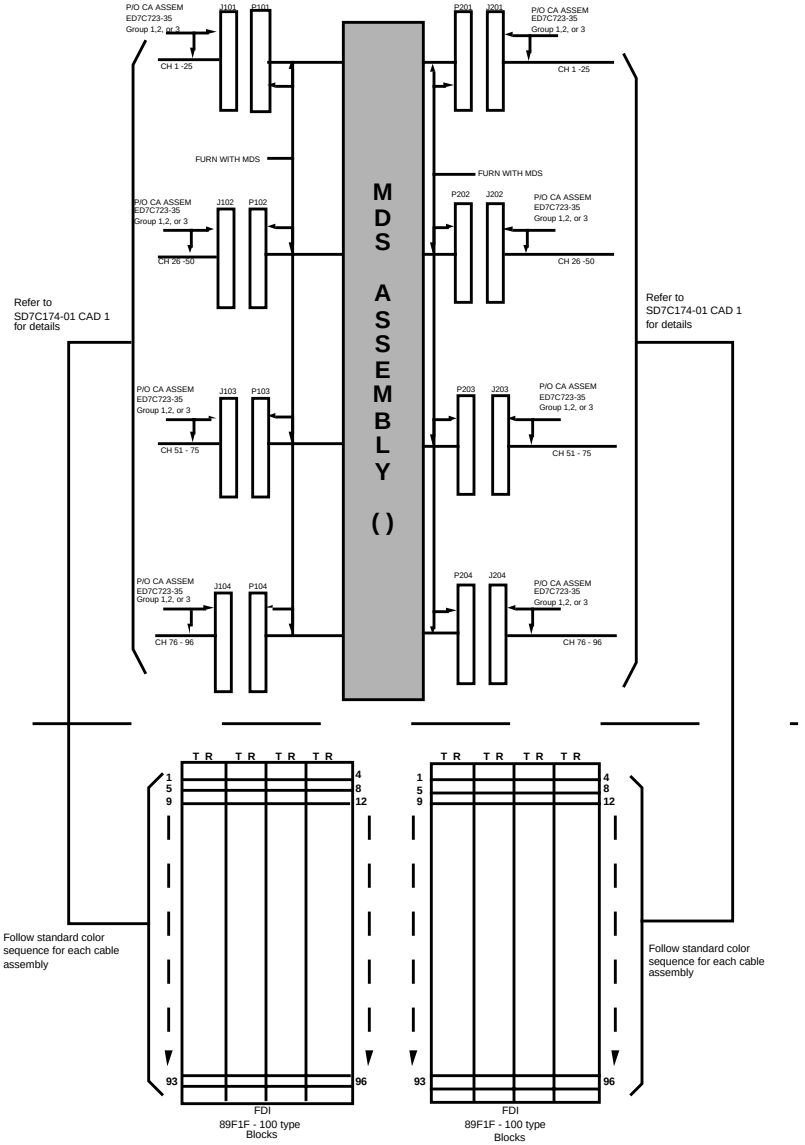


Figure A-2. MDS Assembly VF Cabling to FDI

E&M Signaling Interconnections

Circuit Numbering

VF channel numbering is from 1 to 96 at each of the eight MDS shelves (4 MDS Assemblies). Signaling leads, E, M, SB, SG are associated with the channel slots, 1 to 24 on each MDS shelf. Figure A-3 depicts a typical cross-connect block, indicating the first channel number for each slot.

Derived pair numbering for the outside plant (OSP) cables at the MDF is in blocks of 100 pairs with the following association for the possible 768 channels.

Table A-2. OSP Cable Pair/MDS E&M Channel Numbering

OSP	MDS		
Cable Pair	Shelf	Channel	Connector
001-096	1	1-96	J105-J106
101-196	2	1-96	J205-J206
201-296	3	1-96	J105-J106
301-396	4	1-96	J205-J206
401-496	5	1-96	J105-J106
501-596	6	1-96	J205-J206
601-696	7	1-96	J105-J106
701-796	8	1-96	J205-J206

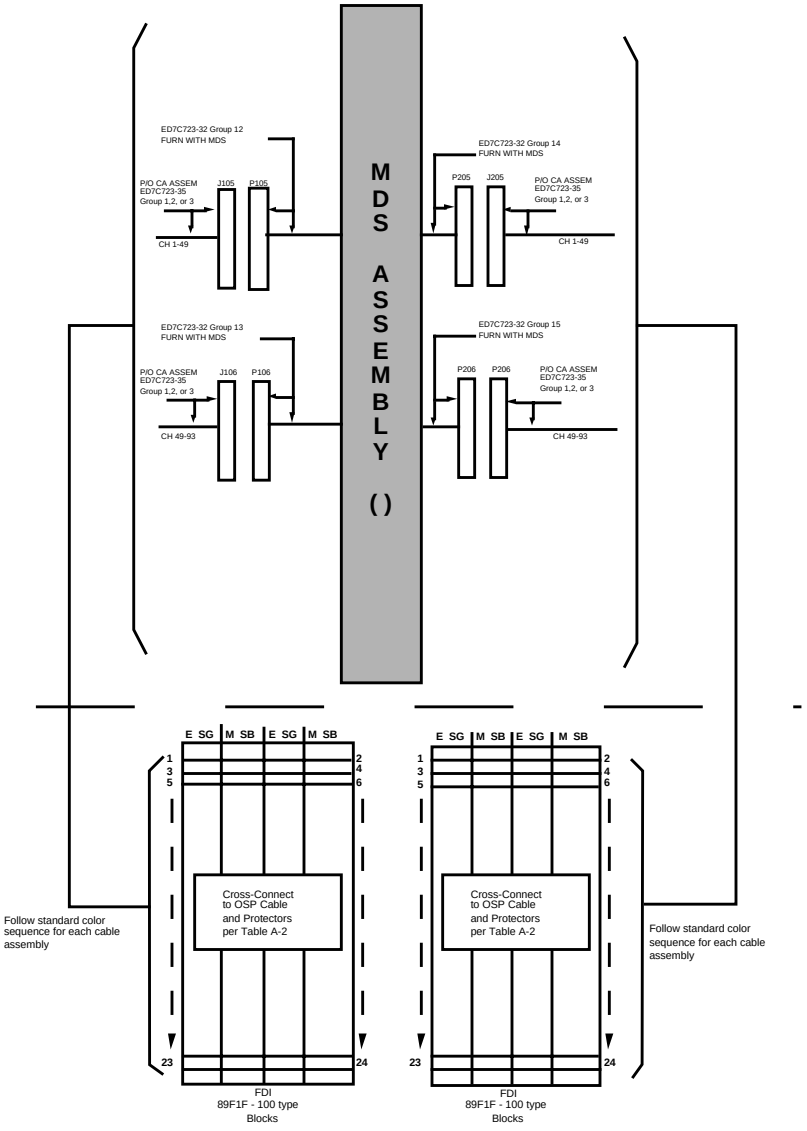


Figure A-3. MDS Assembly E&M Cabling to FDI

DSX-1 Interconnections

The *SLC*-2000 System supports either DS1 Distribution or DS1 Feeders, but not both simultaneously from the ARM shelf. The same cables may be used to connect to the DSX-1 but they must be connected at the ARM shelf to the appropriate connectors for their intended application as follows:

J160	DS1 Feeder Input 1-16
J161	DS1 Feeder Input 17-28
J162	DS1 Feeder Output 1-16
J163	DS1 Feeder Output 17-28
J165	DS1 Distribution Output 17-28
J166	DS1 Distribution Output 1-16
J167	DS1 Distribution Input 17-28
J168	DS1 Distribution Input 1-16

The MSDT Server (SPQ®808 or *SPQ*809) or DT Server (*SPQ*810), plugged into the MDS, can operate over standard T1 facilities by using the ED7C723-35, Group 17 Cable Assemblies and the ED7C723-35, Groups 19 through 22, Cable Assemblies as inputs/outputs from the MDS to the DSX-1 or T1 facility.

J101	DS1 Distribution Input/Output
J102	DS1 Distribution Input/Output
J103	DS1 Distribution Input/Output
J104	DS1 Distribution Input/Output
J201	DS1 Distribution Input/Output
J202	DS1 Distribution Input/Output
J203	DS1 Distribution Input/Output
J204	DS1 Distribution Input/Output

The ED7C723-35, Group 18, Cable Assemblies may be used to connect a miscellaneously mounted HDOS to a DSX-1 panel.

DS1 Feeders

The *SLC*-2000 System provides a DS1 metallic feeder capability as a start-up system without using the SONET feeder circuit packs except for the controllers. This system, which is not compatible with other network elements in a SONET network, utilizes quad LIUs interfacing with the DSX-1 for cross-connection to an external multiplexer or external protection and repeater shelves for T1 feeder applications.

DS1 Distribution

DS1 Pipes

The *SLC*-2000 System can be configured to support up to 28 DS1 pipes without using an external multiplexer. In a DS1 only configuration no MDS are provided and the DS1 pipes can be used to support DS1 service or DS1 interfaces for collocated *SLC* Series 5 or *SLC* 96 systems. This configuration is used for those applications that initially require up to 28 DS1s and anticipate future DS0 services. Whenever DS0 services are needed MDS assemblies can be added.

DS1 Extensions

The DDM-Plus system provides both metallic and optical DS1 extensions. For metallic applications the DDM-Plus can be used as a repeater shelf for T1 extensions. For optical applications the DDM-Plus provides multiplexed optical transport of four DS1 pipes on multimode or single mode fiber.

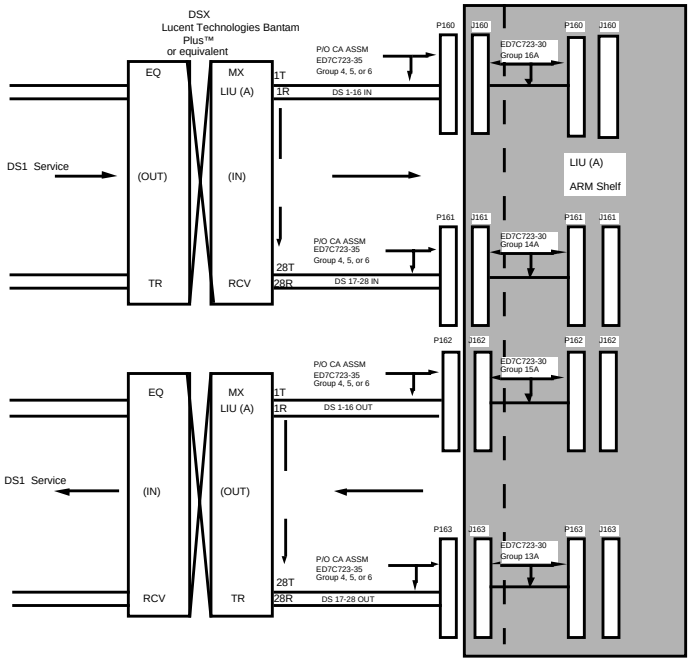


Figure A-4A. DS1 Feeder Cabling

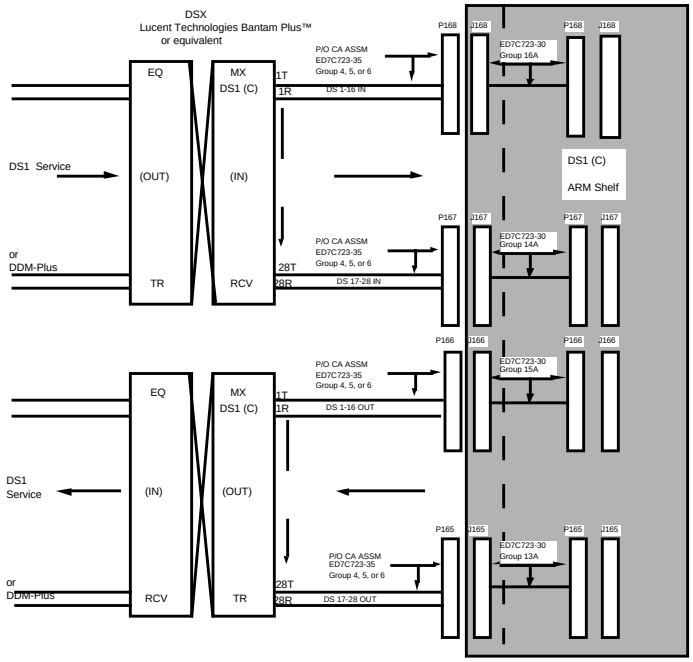


Figure A-4B. DS1 Distribution Cabling

T1 Metallic Distribution

The *SPQ*808 and *SPQ*809 MSDT Servers use the VF Channel Bank pairs of the MDS as outputs to the DSX-1 or T1 facility. The tip and ring copper pairs in the connector cables are used for the transmit (T, R) and receive (T1, R1) direction for the T1 facility. These transmit and receive pairs should be connected to the DSX-1 cross connect panel where they are wired to an office or line powering repeater. The T1 repeater is wired to the OSP copper facilities where all standard T1 design and testing rules apply. The other end of the T1 facility is the distant terminal MSDT containing the BYB2 LIU circuit pack.

Figure A-4C represents a typical cable connection for the first MDS shelf employing MSDT Servers in all available CU slots for that shelf. Other MDS shelves will follow the same arrangement but utilizing other J191, J192/P191, P192 combinations.

Figure A-4D represents the system interconnections between the RT and DT locations via the DSX-1 Cross connect interface.

The *SPQ*809 and *SPQ*810 DT Servers use the J101/J201, J102/J202, and J103/J203 connectors of the MDS as inputs/outputs to the DDM-2000 FiberReach Wideband Shelf (WBS), DSX-1 panel, or T1 facility. The Digital Terminal (DT) or

Optical Network Unit (ONU) contains the DDM-2000 FiberReach Narrow Band Shelf (NBS) with or without the WBS. The two WBS will be connected optically but, if the WBS are not equipped, the NBS will be connected by a T1 facility to the DSX-1 panel, if equipped, in the Host Digital Terminal (HDT).

Protector Blocks

UL approved installations require a protected wire system which consists of Lucent Technologies Protectors on all outside plant telecommunications circuits. Lucent Technologies standard circuit 4C1E-W (black) or special circuit 4C3E-W (red) protectors and building entrance cable shall be located as specified in Article 800-2 of the National Electric Code, ANSI/MFPA number 70-87.

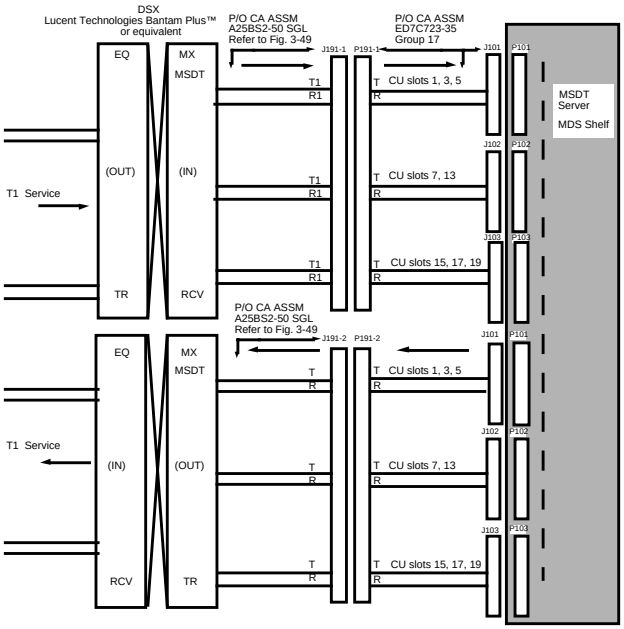


Figure A-4C. MDS/DSX-1 Typical T1 Metallic Distribution Cables

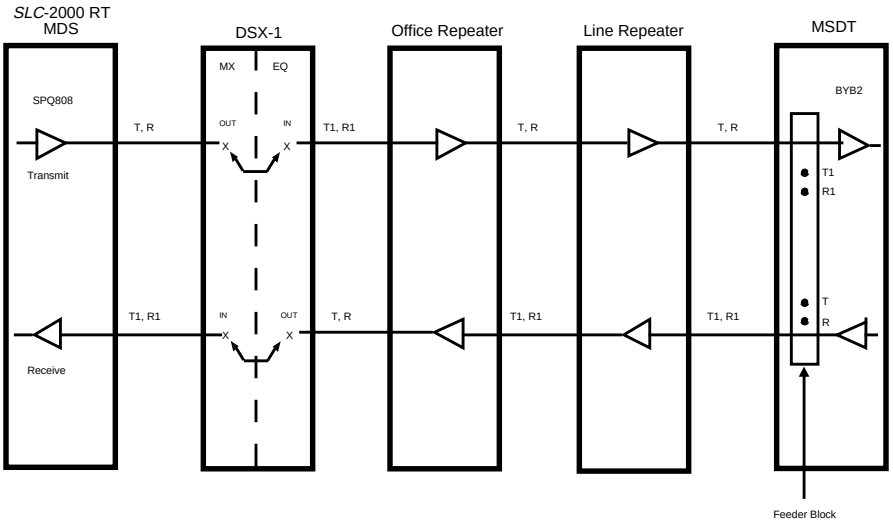


Figure A-4D. MDS/MSDT T1 Metallic Distribution System Interconnections

Optical Fiber Interconnections

All lightguide interconnect cables should be brought out to the LGX® lightguide cross connect panel or other vendor's customer cross connect point. Appropriate designations should be added at this frame to identify the function from the *SLC*-2000 end.

NOTE:
The minimum bending radius for fiber jumper cables is two inches (diameter of four inches).

SONET Interface (ARM Shelf OLIU)

Up to two OLIUs designated Main and Protection (or Main 1, Main 2) can be provided at the RT Bay. Fiber pairs (transmit and receive), equipped with ST® connectors, are connected at the OLIU faceplate connectors designated IN and OUT. Cross connections at the *LGX* are made to the optical line system to the far-end DDM-2000.

FITL Interface (HDOS OU)

Optical Units in the HDOS are assigned according to the number of MSDTs supported. One single (transmit and receive functions on the same fiber), single-mode fiber, terminated with a *ST* connector, is connected to the rear HDOS shelf position (J1 through J39). This shelf position is occupied by an OU assigned to a particular MSDT server in the MDS. Refer to Table 3-2 in Chapter 3 for the complete OU/MSDT Server assignments. Cross connections at the *LGX* are made to the optical line system associated with the remote MSDT.

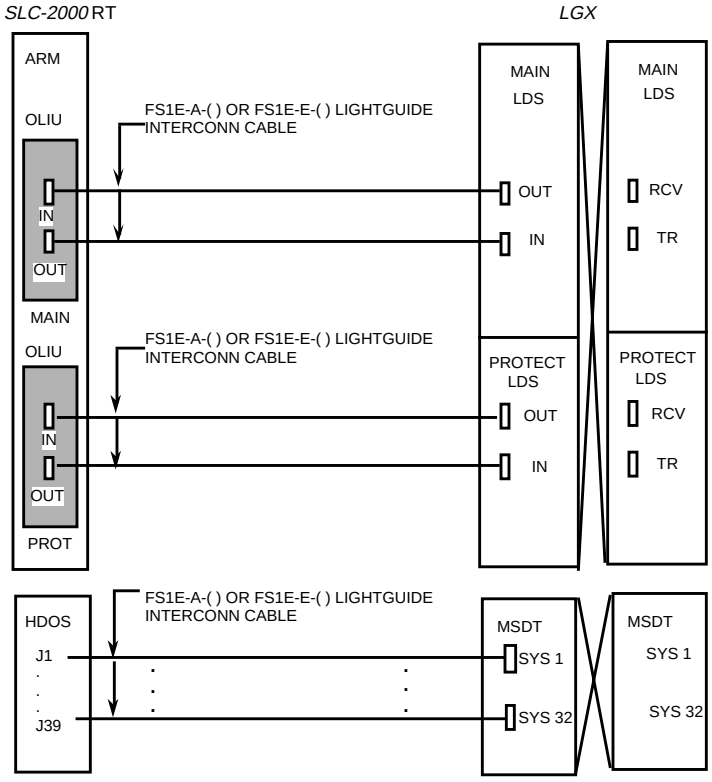


Figure A-5. LTG Cabling OLIU/OU

Miscellaneous Discrete/Environmental Alarm and Control Applications

NOTE:
Miscellaneous discrete environmental status points operate independently of the parallel telemetry and status points. Example: an environmental status condition that turns on a miscellaneous discrete environmental status point will not turn on a parallel telemetry ID or far end ID status point.

Miscellaneous discrete environmental alarm points are coordinated with the parallel telemetry alarm and status points. Example: an environmental alarm condition that turns on a miscellaneous discrete environmental alarm point will turn on the appropriate parallel telemetry alarm point and system ID and far end ID status point.

Inputs

Fourteen miscellaneous alarm or environmental inputs are available at the COT site for monitoring local environmental conditions such as open door, high temperature, low fuel, etc. The inputs can also be used to remote alarms from collocated equipment such as the DDM-Plus system. These inputs (TLMI 1-14) are activated by contact closures to ground which provide -48v nominal (-60v maximum) open circuit voltage and source 2 ma. maximum current when activated.

Outputs

Four environmental control outputs are available at the COT site for controlling external equipment such as generators, pumps, etc. These outputs (TLMO 1-4) tolerate -60v maximum open circuit voltage and source 35 ma maximum current when activated. Transient voltages up to 135v are tolerated for up to 1 ms. Outputs TLMO 5-16 are not used at the COT site.

NOTE:
The output common leads, TLMO C must be grounded for all applications, even when the control outputs TLMO 1-4, are not used. They can derive ground from the internally grounded VTR leads.

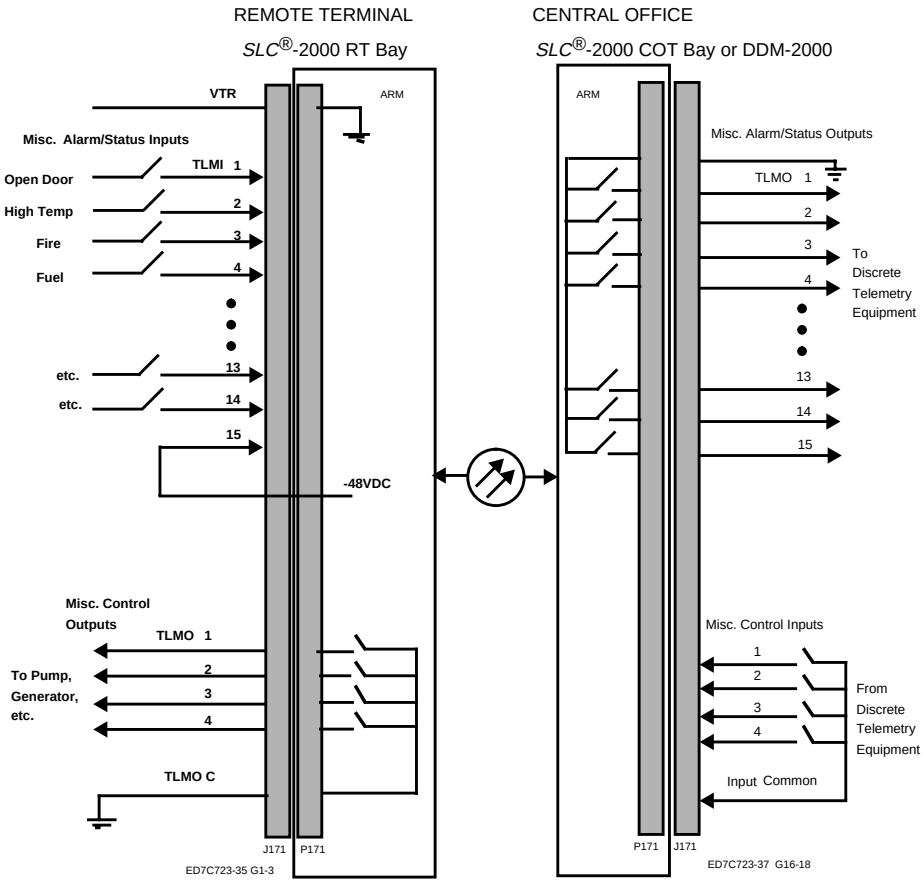


Figure A-6. Typical Miscellaneous Discrete Environmental Alarms and Controls

RT Input Alarms Applications

General

The *SLC*-2000 system provides a set of user-definable miscellaneous discrete environmental alarms and controls to allow monitoring and control of collocated equipment at a remote site. See Figure A-7 for the RT input alarm cabling and typical alarm cross connections.

Fifteen miscellaneous discrete alarm/status points monitor environmental conditions at remote terminal sites. These include such conditions as *open door* and *high temperature*. Contact closures to ground activate the first fourteen points. The fifteenth point monitors the remote structure power and fan apparatus (for example, DC power shelf failure). A -48 volt DC input activates this point.

Four control points control equipment, such as pumps and generators, at the remote terminal site. When activated, the control points provide a contact closure between the control point output and ground.

The *SLC*-2000 RT provides the following alarms, described in the paragraphs below, in addition to the miscellaneous discrete inputs mentioned above:

- Power Minor (PMN)
- External Minor (MN)
- External Major (MJ)

Power Minor Alarm

This alarm is used to detect the loss of commercial ac power at the RT and is not considered service affecting when the RT power system has battery back-up. This input expects a -48 VDC through a closure to activate the alarm and the no alarm state is an open circuit.

Minor Alarms

Minor alarms are classified as not service affecting and are used to detect the failure of a single rectifier in the power system, a single ringing generator in a protected ringing system, or a fan failure. This input expects a -48 VDC through a closure to activate the alarm and the no alarm state is an open circuit.

Major Alarms

An example of a service affecting external major alarm is the loss of the entire ringing supply to the RT system. This input expects a ground through a closure to activate the alarm and the no alarm state is an open circuit.

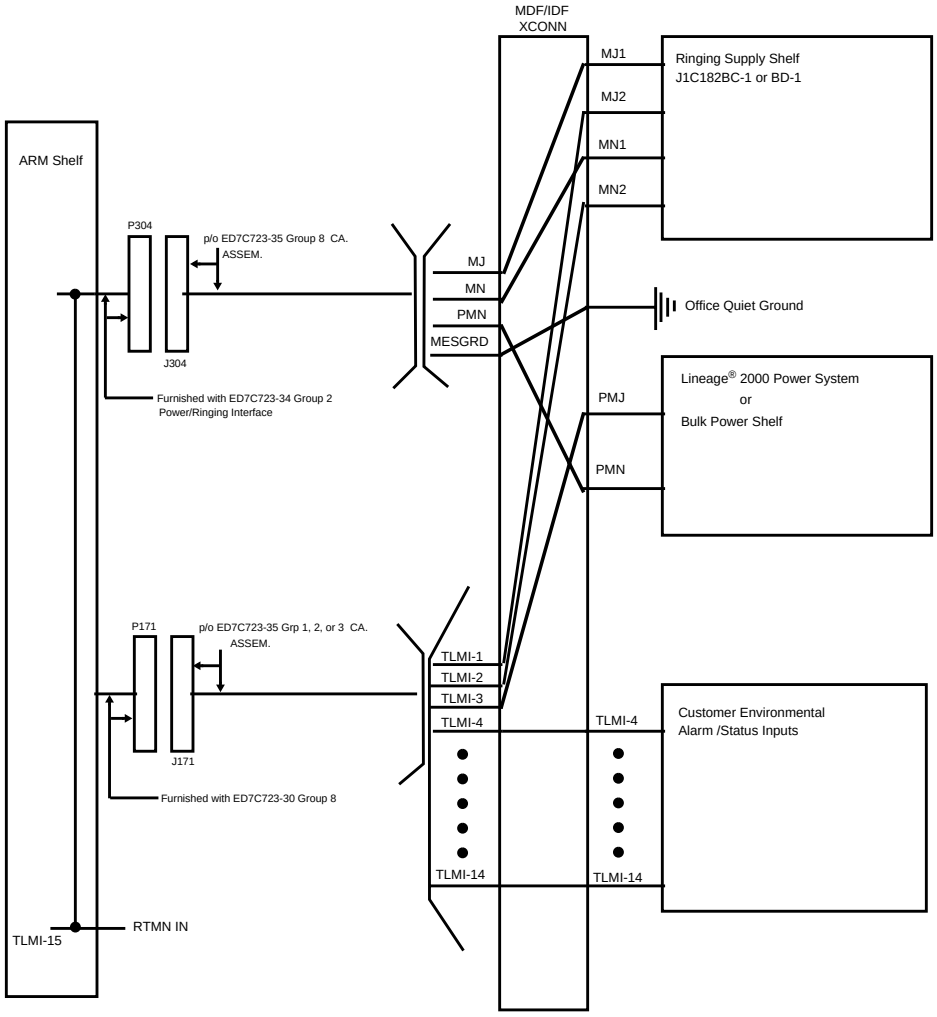


Figure A-7. RT Input Alarms Cabling and Typical Cross Connections

Power and Ringing Interconnections

External sources are required to provide D.C. power and ringing voltages to the RT Bay. Typical examples are the Lineage® Power Plant and the J1C182BC Ringing Shelf or, for smaller applications, the J1C182BD Bulk Power and Ringing Shelf.

Multi-bay Remote Terminal Applications

Figure A-8A represents the connections to the *SLC*-2000 RT Bay utilizing customer provided -48v. D.C. source and the J1C182BC Ringing Shelf. This shelf should be equipped with 3 type Ringing Generators protected by Ringing Control Units (AUG3).

Power

Two D.C. power feeder pairs, each protected with a 30 amp circuit breaker are required from the -48 voltage source. Wire gauge requirements are as follows:

less than 30 feet	10 gauge
more than 30 feet	gauge wire to limit D.C. drop to 1.5v max. at 25 amps, splicing down to 10 gauge before connecting at TB1.

Ringing

At least two external ringing supplies in a protected system should be provided, each supplying -20Hz and +20Hz ringing current to the RT Bay. Figure A-8A represents a typical arrangement utilizing the J1C182BC-1 Ringing Shelf equipped with 3 type Ringing Supplies with the capability of supplying four RT Bays. Note that using this arrangement employs also the factory assembled cables ED7C723-35 Group 9 and Group 10. Other vendors' ringing supplies would require another cable arrangement requiring field assembly.

NOTE:
Positive ringing voltage (+20Hz) is only required when multiparty circuits are provisioned.

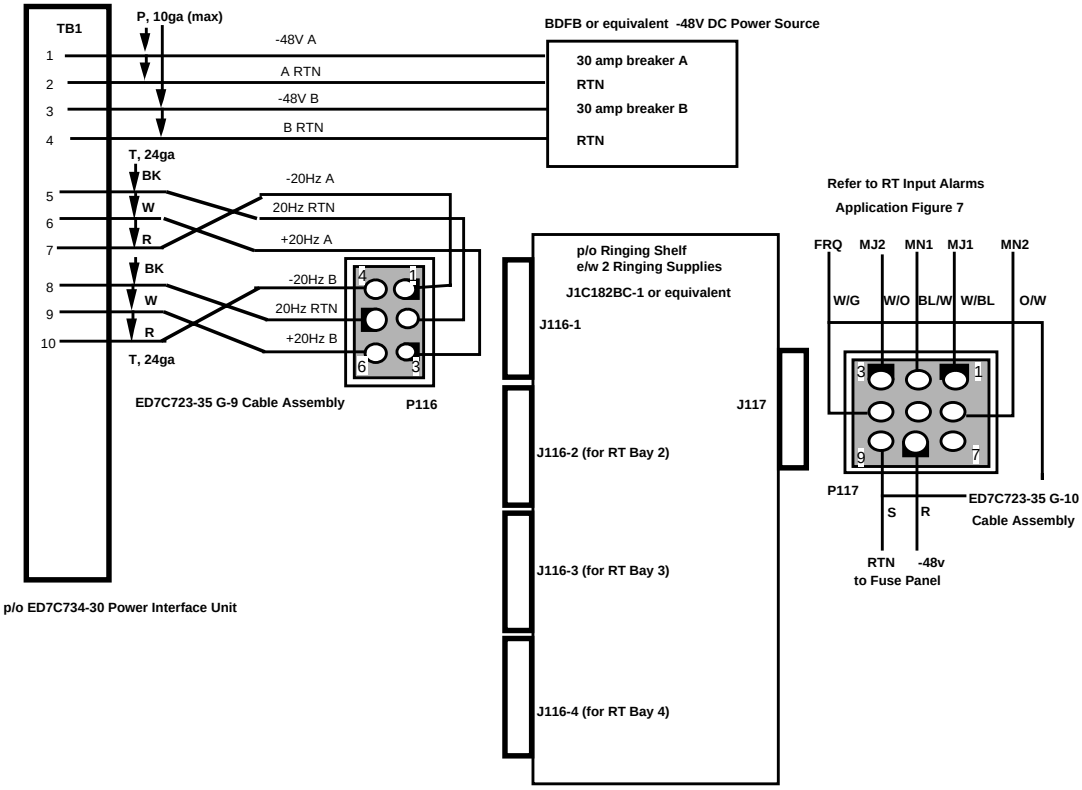


Figure A-8A. Power and Ringing Cabling (J1C182BC-1)

Small-scale Remote Terminal Applications (Customer Premise)

Figure A-8B represents the connections to the *SLC*-2000 RT Bay utilizing the J1C182BD Bulk Power and Ringing Shelf. This shelf should be equipped with 336A type Rectifiers and 3 type Ringing Generators with a Ring Control Unit (AUG3).

Power

The J1C182BD shelf is equipped with a power cord which requires two 120v. input feeds, each fused at 20 amps. These inputs can be 240v/120v single phase circuit. The shelf can also be operated at a reduced 13 amp. load output using only a single 120v., 20 amp. input. The 336A type rectifiers provide -48v. D.C. outputs.

Connections from the shelf to the *SLC*-2000 PIU -48v D.C. terminals must be field assembled using 14 gauge wire and matching pins for the P100 plug which must be provided separately.

Ringing

At least two external ringing supplies in a protected system should be provided, each supplying -20Hz and +20Hz ringing current to the RT Bay. Figure A-8B represents a typical arrangement utilizing the J1C182BD-1 Ringing Shelf equipped with 3C type Ringing Supplies.

Connections from the shelf to the *SLC*-2000 PIU ringing terminals must be field assembled using 20 and 24 gauge wire and matching pins for the P100 plug.

NOTE:
Positive ringing voltage (+20Hz) is only required when multiparty circuits are provisioned.

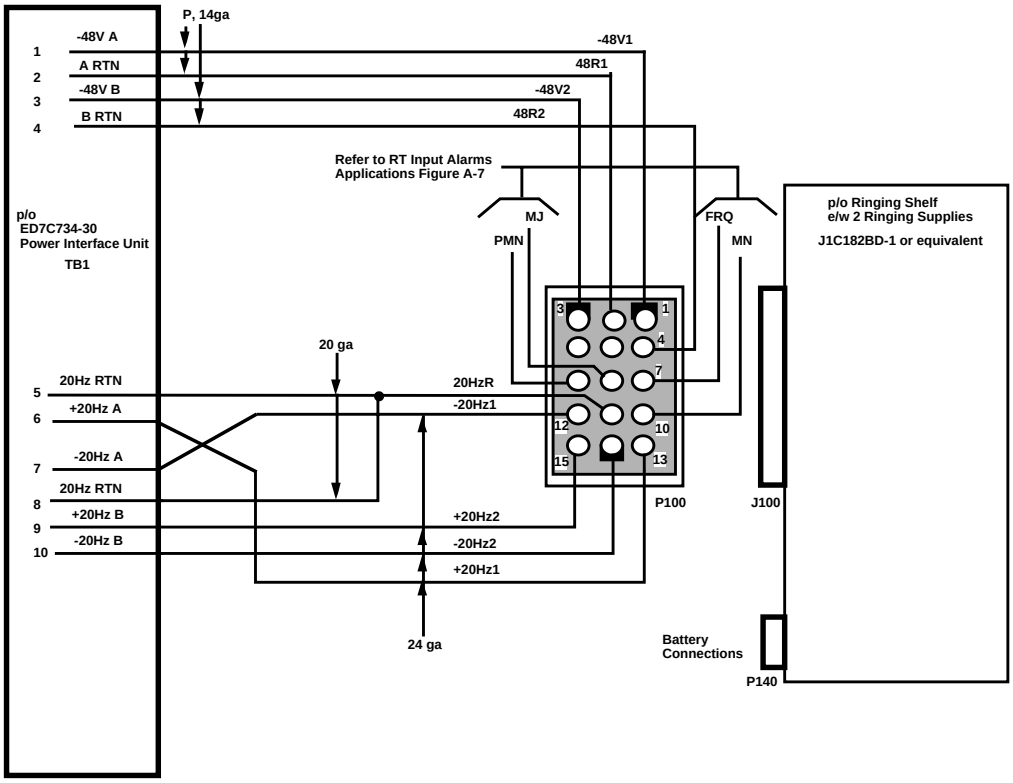


Figure A-8B. Power and Ringing Cabling (J1C182BD-1)

DC Test Access Application

Drop or loop testing is provided via the *SLC*-2000 Integral Test Head (ITH), or a Remote Measuring Unit (RMU), Tollgrade DC by-pass pair or a metallic D.C. by-pass test pair. The SLC Access System is compatible with the Pair Gain Test Controller (PGTC) or Extended Test Controller (XTC), operating in the PGTC mode, for demand loop testing of universal systems.

Metallic DC Test Pair

Refer to Figure A-9A for a typical overall testing arrangement utilizing the metallic D.C. Test Pair.

Only one test pair is needed to any remote site for a maximum of 1,000 lines by multiplying the TTR and TTT leads at the distributing frame. Any number of *SLC*-2000 COT systems assigned to the same RT location can share the same DC Test pairs (TTT, TTR). The inhibit leads (INH) of the shared system must also be strapped together provided the 1,000 line maximum restriction is observed or as traffic dictates.

Figure A-9B represents a typical Test Access (DC Test) Pair cabling arrangement with one *SLC*-2000 COT serving two remote sites each with four *SLC*-2000 RT bays. Note that all inhibit leads from the one COT frame that are associated with the same DC Test pair are multipled (strapped) together at the MDF. A separate metallic test pair is run to each remote site.

NOTE:
Cross connections to the DC Test Pair must utilize protectors at the MDF and FDI.

The metallic pair tip and ring leads are multipled to their respective DC Test Pair tip and ring leads at the MDF and FDI.

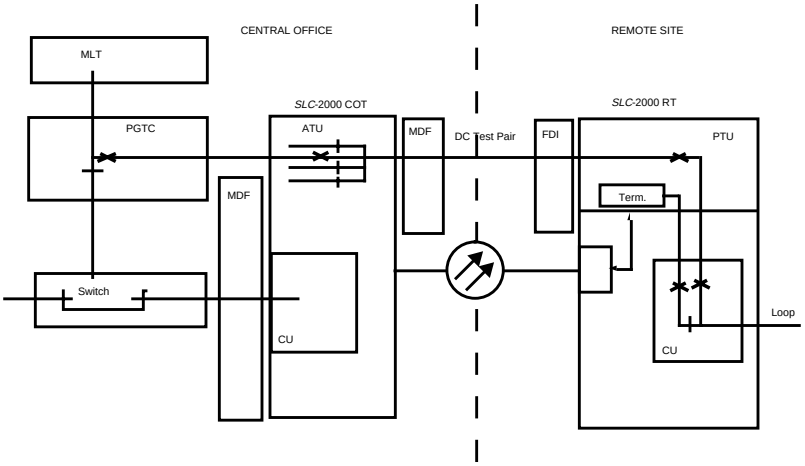


Figure A-9A. Typical DC Test Pair Arrangement

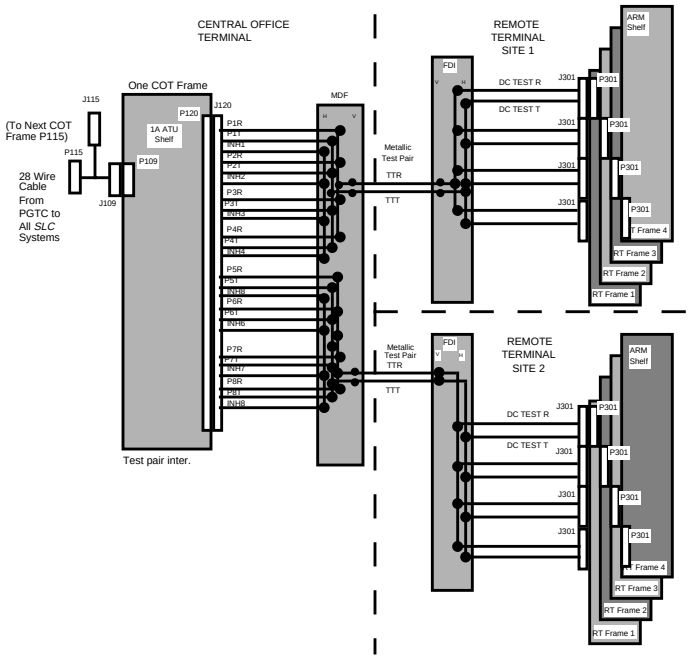


Figure A-9B. Test Access Pair Cabling

Remote Test Units

*4TEL RMU**

The *RMU* measurement equipment requires the use of two digital loop carrier VF channels; one for communication to the host-switch *RMU* measurement equipment and one for use as a sample line for testing *RMU* equipment operation. The recommended channels for these purposes are channels 3 and 4 of the first MDS shelf in the RT bay. This is consistent with MDS shelves in cabinet applications. Channel 3 is used for the sample line. Channel 4 is used as the communications line.

In existing sites into which the *RMU* and LTF are being retrofitted, channels 3 and 4 will be utilized. The customer must be made aware of the usage of these lines. If these channels have been preassigned, the operating company must then assign another two channels for these purposes.

NOTE:
The sample line and communication line (channels 3 and 4) should be isolated from accidental usage by replacing the existing protectors with Service Denied protectors (4C2E-W type).

* 4TEL and RMU are registered trademarks of Teradyne, Inc.

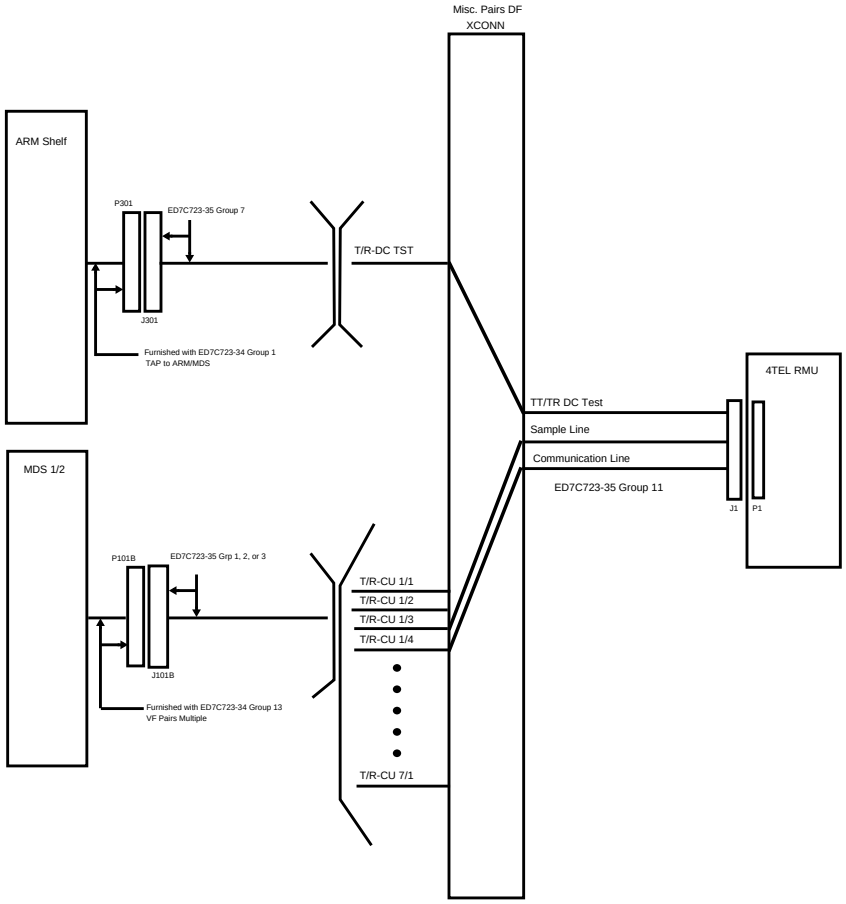


Figure A-10. 4TEL RMU Typical Cross-connections

Reliance INTS

The first twenty-five channels from the MDS are cabled to the Misc. Pairs Cross-connect block for communication access to the INTS. The INTS provides two DDS lines, modem lines and dial-up lines; their use dependent upon whether dedicated or dial-up access is required and the equipment configuration at the central office with access to the operations systems. DDS1 is dedicated to the SARTS OS and DDS2 to the Reliance Supervisory System.

The *SLC*-2000 TAP bus is cabled to the Misc. Pairs Cross-connect block for test access to both the equipment and facility sides of the special service circuits.

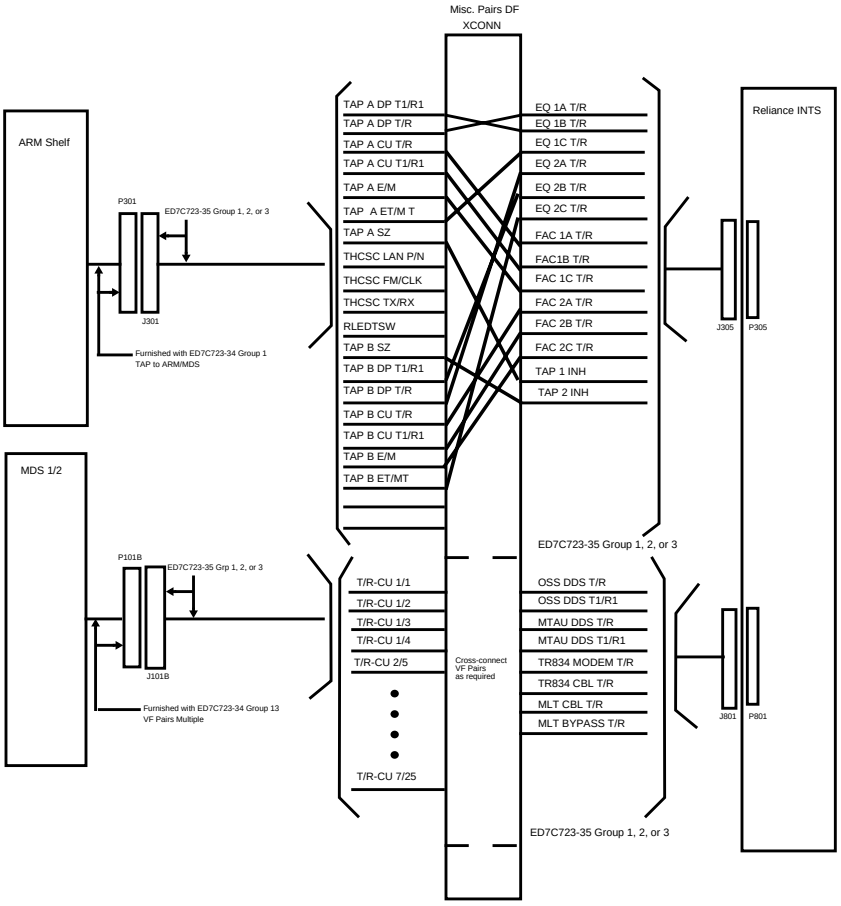


Figure A-11. Reliance INTS Typical Cross-connections

Application Schematics

The *SLC*-2000 Remote Terminal Application Schematic SD7C174-01 conveys the design intent and contains detailed information pertaining to system interconnect requirements. This information is presented as follows:

BD Figures	Block Diagrams for bay cables
FS Figures	Functional Schematics for each interconnection
APP Figures	Apparatus Figures for cable and shelf equipment codes
Circuit Notes	Transmission, voltage, current, and other electrical requirements
Equip. Notes	Cable, equipment, mechanical/physical requirements
Inform. Notes	Circuit nomenclature conventions, features/options tables
CAD Figures	Cable Assembly Details

NJ00675A-2 Dual Power Feed Unit Installation Procedure

1

General

Scope

This appendix to the Customer Assembly Manual for RT Frames provides the installation and test information to install the NJ00675A-2 Dual Power Feed Unit (DPFU) on the J1C265A-1 Remote Terminal Bay.

Overview

Many systems utilize dual power feeds (-48VDC) from a Battery Distribution Fuse Board (BDFB) or other source, usually designated “A” and “B”, to provide redundant battery feeds. In practice, if one feeder goes down, many systems, including *SLC®*-2000 Access System, are designed to lose partial, but not total, functionality. An example would be a *SLC*-2000 system, where the failure of one of the feeders would remove power from four (4) of the eight (8) Metallic Distribution Shelves, thereby causing a potential lost of service on up to 384 circuits (and more under certain conditions). The DPFU is designed for applications where a partial loss of functionality is unacceptable. The unit is designed to monitor the dual primary feeds from the BDFB and will, if it senses a primary feeder failure, automatically switch both secondary feeders to the remaining primary feeder, thereby keeping the system fully operational. The unit also provides independent discreet alarm indications and closures relating to the status of both primary feeders.

Reason for Reissue

Original issue.

Support

If any of the steps specified in this procedure cannot be completed as indicated, call the next level of support or the Lucent Technologies Regional Technical Assistance Center (RTAC) by the following phone number for assistance.

RTAC: 1-800-CAL RTAC (225-7822)

Training

No specific training is required.

Time Estimates

a. Overall time to perform this procedure is estimated to be one hour.

b. There will be no time out-of-service during this procedure.

c. One installer or craftsperson is recommended for this procedure.

Risk Assessment

Procedural Risk Assessment (DPFU added out of service)

Rating:

LOW Since the DPFU is to be installed prior to service turn-up this procedure has a **LOW** procedural risk rating, since there is **NO** potential for a service interruption to the end customer, if any procedural deviations or procedure specific equipment failures occur during the procedure.

Procedural Risk Assessment (replacing or “hot swapping” a defective DPFU)

Rating:

LOW Since the DPFU cabling is designed to facilitate this procedure on an in-service system this procedure has a **LOW** procedural risk rating, since there is **low** potential for a service interruption to the end customer, if any procedural deviations or procedure specific equipment failures occur

during the procedure. Nonetheless this procedure should be scheduled during a low usage maintenance period.

Procedural Risk Assessment (DPFU added to an in-service system)

Rating:

MEDIUM Installing the DPFU in an in-service system constitutes a **MEDIUM** procedural risk rating, since there is a potential for a service interruption to the end customer, if any procedural deviations or procedure specific equipment failures occur during the procedure. This procedure should be scheduled during a low usage maintenance period.

Equipment

Equipment List

The following equipment, apparatus, and tools are required to perform this Modification Implementation Procedure.

Code	Comcode	Qty	Note	Description
NJ00675A-2, L1	601869118	1		Dual Power Feed Unit
NE00675-31, G1		1	R	Cable Assembly (on DPFU)
NE00675-31, G2		1	R	Cable Assembly (PIU to DPFU)
NE00675-31, G3		1	R	Cable Assembly (DPFU to GRD)
		4	R	Mounting Screws
		4	R	6 Gauge Crimp Terminals
		1	R	MIP 363-208-501 (Instructions)
		1	I	Volt-Ohmmeter
		1	I	Crimping Tool (6 gauge)

NOTES:

I = This item may be ordered from Lucent Technologies-IMDARC by the installer.

R = This item is required for installation of and is packaged with the DPFU.

Reference Documents

Reference Document List

Document Number	Description
NJ00675A-2	Dual Power Feed Unit (specification)
NS00675-02	Dual Power Feed Unit (circuit)
NT-00675-31	Dual Power Feed Unit (wiring diagram)

Engineering Information

Engineering Notes

- The unit is 2.0” high, 8.0” deep and mounts in a 23” frame. The mounting brackets are removable and mount in two different positions to accommodate various mounting arrangements. For front access, front cabled arrangements, such as a frame mounted SLC-2000 Remote Terminal (RT), the brackets would be mounted in the forward position (with bracket leg parallel to the side of the DPFU facing forward).
- The unit is convection cooled and consequently no heat baffles or external cooling is required.
- The DPFU should be mounted at the top of the SLC-2000 frame for the Remote Terminals (J1C265A-1, with or without HDOS). In addition, it is recommended that for possible future change outs of the DPFU (hot swap) a space of 2” be reserved directly below the unit. Connecting cables have been designed to facilitate this eventuality.
- The normal operation of the DPFU is to protect the A and B primaries feeding the DPFU from the BDFB. That is, if one primary fails the other will assume the full load and cause no failure of either secondary, each of which powers a portion of the SLC-2000 frame. In a situation with a primary failed the **Alarms** LED representing that primary (A or B) will light and remain lighted until the fault is corrected. On the other hand, if an abnormal fault occurred, for example, such as a diode failure or a control board mal-

function and an **Alarm** LED lighted with all primary and secondary voltages normal, it would be necessary to change out the DPFU in service (hot swap) based on the possibility that the unit would not respond correctly to a future primary failure.

- Circuit breakers **CBA** and **CBB** are rated at 30 Amps. and protect the 10 gauge secondary wiring between the DPFU and the Power Interface Unit (PIU) on the SLC-2000 equipment.
- Fuses **A** and **B** (**-48VDC** & **RTN**), accessible at front panel, are associated with the internally located monitoring circuit.
- Fuses **A** and **B** are GMT type fuses and are rated at 1/2 Amp., 60 Volts.
- The green **Power** LED will light when one or more input feeders is providing -48VDC.
- Red **Alarms** LED (**A**) is associated with input A and will light if input A is not present. When LED (**A**) is lit, a loop closure can be sent to associated SLC-2000 System or elsewhere via terminals **1** and **2** of the **Alarms** terminal block, located on the DPFU faceplate.
- Red **Alarms** LED (**B**) is associated with input B and will light if input B is not present. When LED (**B**) is lit, a loop closure can be sent to associated SLC-2000 System or elsewhere via terminals **3** and **4** of the **Alarms** terminal block, located on the DPFU faceplate.
- If alarm signals are sent to the SLC-2000 use J171 connector, used for miscellaneous discrete environmental alarms. See the appropriate customer assembly manual (363-208-010 for RTs, 363-208-010 for COTs) for details.
- Normal operation of the unit is as follows:
  - Green **Power** LED lit
  - Both red **Alarms** LED's **A** and **B** extinguished
  - Both alarm outputs **A** and **B** are open
  - Both power outputs are active
- In order for the DPFU to provide power on both outputs from a single input, the circuit breakers or fuses feeding the inputs must be sized at 45 or50 Amps and the input wiring must be 6 gauge. In addition, the output wiring from the DPFU to the *SLC*-2000 System must be 10 gauge.

Installation Procedure

Description

The following procedures are divided into three distinct areas depending on whether you are (1) adding a DPFU at the time of the initial SLC-2000 installation, (2) changing out a DPFU that has failed or (3) adding a DPFU to an in-service system. Select the procedure that meets your situation.

DPFU Added Out-of-Service (New Installation)

Description

This procedure involves the adding of a DPFU, on an out-of-service basis, to operate with a SLC-2000 Remote Terminal Bay (RT) which utilizes dual power feeds.

Shelf Installation

Step 1: This unit is provided with removable mounting brackets that can be positioned in one of two positions on each side of the shelf depending on the type of framework used. For front access, front mounting applications (RT) with extended mounting, the brackets would be located in the forward position.

Step 2: Mount the unit from the front of the bay (extended mounting), with the hardware provided (.12-24 X 1/4”), at the top of the bay, using mounting holes #77 and #78 respectively.

Step 3: .Locate the NE00675-31, G3 green/yellow ground strap shipped with the DPFU. Connect one double lug securely to the rear of the DPFU with the lug to the left, as viewed from the rear. The other lug will be attached to the top of the frame using the same holes used for the bay ground cable. For a RT the cable is attached to the bay on same side as the equipment mounts. In this case the cable must be passed through the oval, grommeted hole in order to reach the front side. Remove the two 12-24 thread forming screws holding the bay

ground cable in order to refasten the same and the DPFU ground lug. Lugs should be positioned in an overlapping manner with wires going in opposite directions.

Power Wiring

CAUTION:
This instruction assumes that the DPFU is being installed, with the equipment it will work with, at the time of initial installation. Consequently, there will be no voltage appearing at the DPFU or the equipment unless specifically requested via these instructions.

Step 4: Remove plastic cover over terminal strip (TB1).

Step 5: Remove all four (4) SAN-0 1/2 amp fuses from the front panel fuseholders.

Step 6: Locate the NE00675-31 G1 cable. This cable is approximately 18” long and terminates in connector J117 on one end and in four 10 gauge lugs on the other. Connect these lugs, using the cable identification provided on the leads to the four screw terminals on the barrier terminal strip (TB1) designated **OUT** for **-48A, Rtn A, -48B** and **Rtn B**. Verify that the terminal strip screws are tightly fastened.

Step 7: Dress the J117 end of the cable over to and into the vertical duct on the right side, as viewed from the front.

Step 8: Locate NE00675-31 G2 cable. This cable consists of two connectors on one end (P117A and P117B) and four 10 gauge unterminated leads at the other designated **-48A, Rtn A, -48B** and **Rtn B.** It will be used between the SLC-2000 Power Interface Unit (PIU) and the J117 connector referenced in Steps 5 and 6 above.

Step 9: For a RT locate the PIU on the right side of the ARM shelf as viewed from the front.

Step 10: Connect the four pigtails to the PIU while matching the lead designations to the PIU designations. These leads must be dressed through the grommeted hole at the bottom of the PIU.

Step 11: With a RT dress the cable assembly up the right duct, as viewed from the front, and connect P117A to J117. P117B will be left unconnected and should be located in such a manner as to allow it to reach a NE00675-31 G1 cable attached to a second DPFU mounted directly under the first. Secure the cable in the duct.

Step 12: Using two 6 gauge pairs, with 6 gauge crimp lugs (provided with the DPFU) attached at the DPFU end, attach the lugs to TB1 terminal strip using the four terminals designated **IN**, with the leads marked and specifically attached to terminals designated -**48A**, **Rtn A**, **-48B** and **Rtn B.** The other end of the 6 gauge primary pairs should terminate on the BDFB and should be connected to 45 or50 Amp. breakers, which will be set to open. For a RT simply dress the leads directly into the right vertical duct, as viewed from the front.

Step 13: From the Alarms terminal strip run a 22 gauge pair from the 1 and 2 terminals to the MDF or other location, as required for an alarm indication (loop closure) of loss of A feed.

Step 14: From the Alarms terminal strip run a 22 gauge pair from the 3 and 4 terminals to the MDF or other location, as required for an alarm indication (loop closure) of loss of B feed.

Turn-up and Test

Step 15: Using a VOM check TB1 (main terminal strip) terminals **-48A(Out), -48B(Out), -48A(In)** and **-48B(In)** for the absence of ground.

Requirement: -42 to -56VDC

Step 16: Turn on the 45 or 50 amp. circuit breakers on the BDFB or elsewhere.

Step 17: With the VOM measure voltage on **-48A** and **-48B Out** terminals. While checking these voltages open and close **CBA** and **CBB** to verify that the circuit breakers are protecting the secondary feeds. Leave breakers in the on position.

Requirement: -42 to -56VDC

Step 18: Engage all four (4) GMT type 0.5 Amp fuses.

Step 19: Verify that the green **Power** LED lights on the front panel.

Step 20: Verify on P2 (Alarms) terminal strip that there is no continuity (using VOM as ohmmeter) between terminals **1** and **2** and **3** and **4** respectively.

Step 21: Open 45 or 50 Amp. circuit breaker A on the BDFB. Green **Power** LED should remain lighted. Verify **A Alarms** LED lights and that continuity exists between P2 (Alarms) terminals **1** and **2 (A)**.

Step 22: Restore circuit breaker A then open 45 or 50 Amp. circuit breaker B on the BDFB. Green **Power** LED should remain lighted. Verify **B Alarms** LED lights and that continuity exists between P2 (Alarms) terminals **3** and **4 (B)**.

Step 23: Restore circuit breaker B.

Step 24: Replace plastic cover on DPFU faceplate.

Step 25: Procedure complete.

DPFU In-Service Change Out (Hot Swap)

Description

Design provisions have been established to allow the replacement of a DPFU, under certain conditions. with a replacement unit without a service interruption. The conditions are such that a A or B alarm is declared indicating a problem with internal diode modules and/or the control board, while both primary voltages and, at least one secondary voltage remain normal. In this case it is clear that the unit must be replaced since the anticipated protection inherent to the unit may not be

viable. Under these, or similar conditions, use the following “hot swap” procedure. Note that in a situation where both secondaries are down the initial DPFU should simply be changed outright, as a service interruption is already in progress.

Step 1: Mount the replacement DPFU directly under the DPFU to be replaced.

Step 2: Locate the NE00675-31 G1 cable. This cable is approximately 18” long and terminates in connector J117 on one end and in four 10 gauge lugs on the other. For the new DPFU, connect these lugs, using the cable identification provided on the leads to the four screw terminals on the barrier terminal strip (TB1) designated **OUT** for **-48A, Rtn A, -48B** and **Rtn B.** Verify that the terminal strip screws are tightly fastened.

Step 3: Dress the J117 end of the cable over to and into the vertical duct on the left side, as viewed from the front.

Step 4: Remove the plastic faceplate covers (TB1) from both units.

Step 5: On the defective DPFU, after verifying that both primaries are active from the BDFB, disconnect from the TB1 **IN** terminals the primary matching the **Alarms** LED (**A** or **B**) that is lit. Reconnect that feed to the same terminals on the replacing unit.

Step 6: With a VOM verify that -48VDC is present on both secondaries (**-48A** and **-48B OUT**) of the replacement unit. Also verify that the green **Power** LED is lit.

Step 7: Locate the unattached J117connector from the replacing DPFU and engage it to the unused P117B connector (p/o NE00675-31, G2). At this point the replacing DPFUs output is in parallel with the defective unit.

Step 8: On the defective DPFU remove the other primary (**IN**) and reconnect to the In terminals of the replacing DPFU.

Step 9: Disconnect the J117 connector from the P117A connector on the NE00675-31, G2 cable assembly. Attach plastic connector insulator, removed above from P117B, to P117A and dress the unused connector back into the frame.

Step 10: Remove the alarm leads from the **Alarms** terminal strip on the defective unit and reconnect to the replacing unit.

Step 11: Remove the NE00675-31, G3 cable assembly (ground strap) from the rear of the defective unit and reconnect it to the replacing unit (after removing that ground cable).

Step 12: Verify that no connections are associated with the defective DPFU and, if so, remove the unit from the frame.

Step 13: Temporarily remove the mounting hardware from the replacing DPFU in order to reposition it to the top of the frame. Refasten.

Step 14: Procedure complete.

Addition of a DPFU to a In-Service System

Description

The addition of a DPFU to an existing in-service system can be performed in two ways. The first method will cause two partial service interruptions while method two, not supported but possible will, if performed correctly, result in no service interruption.

Method 1

Step 1: Complete all Steps from 1 to 25 with the following modification of Step 10. Tape the four secondary 10 gauge wires and do not connect them to the PIU.

Step 2: When the above is complete, notify the appropriate alarm monitoring facility that service will be interrupted during this procedure. Note that the existing feeds distribute power in the following manner:

- Feeder A powers MDS shelves 1 to 4 as well as the ARM (co-fed)
- Feeder B powers MDS shelves 5 to 8 as well as the ARM (co-fed)

Step 3: Select either feed and open the 30 Amp. breaker at the BDFB. Remove this feed from the PIU and then connect the same feeders, previously taped, from the NE00675-31, G2 cable in their place. Service will be restored on those shelves.

Step 4: Repeat the above step for the other feeder.

Step 5: Tape and/or remove the feeders disconnected from the BDFB.

Method 2

Step 1: Complete all Steps from 1 to 25 with the following modification of Step 10. Tape the four secondary 10 gauge wires and do not connect them to PIU.

Step 2: Match the four secondary 10 gauge feeds of the NE00675-31, G2 cable to the four 10 gauge leads presently running from the BDFB to the PIU. Note that all leads are hot.

Step 3: Using the appropriate 10 gauge parallel tap connectors, connect the matching leads to each other. Cut the wires (hot) going back to the 30 Amp. breakers on the BDFB. Tape the connectors and dress all cables in the vertical duct.

P

Step 4: Procedure complete.

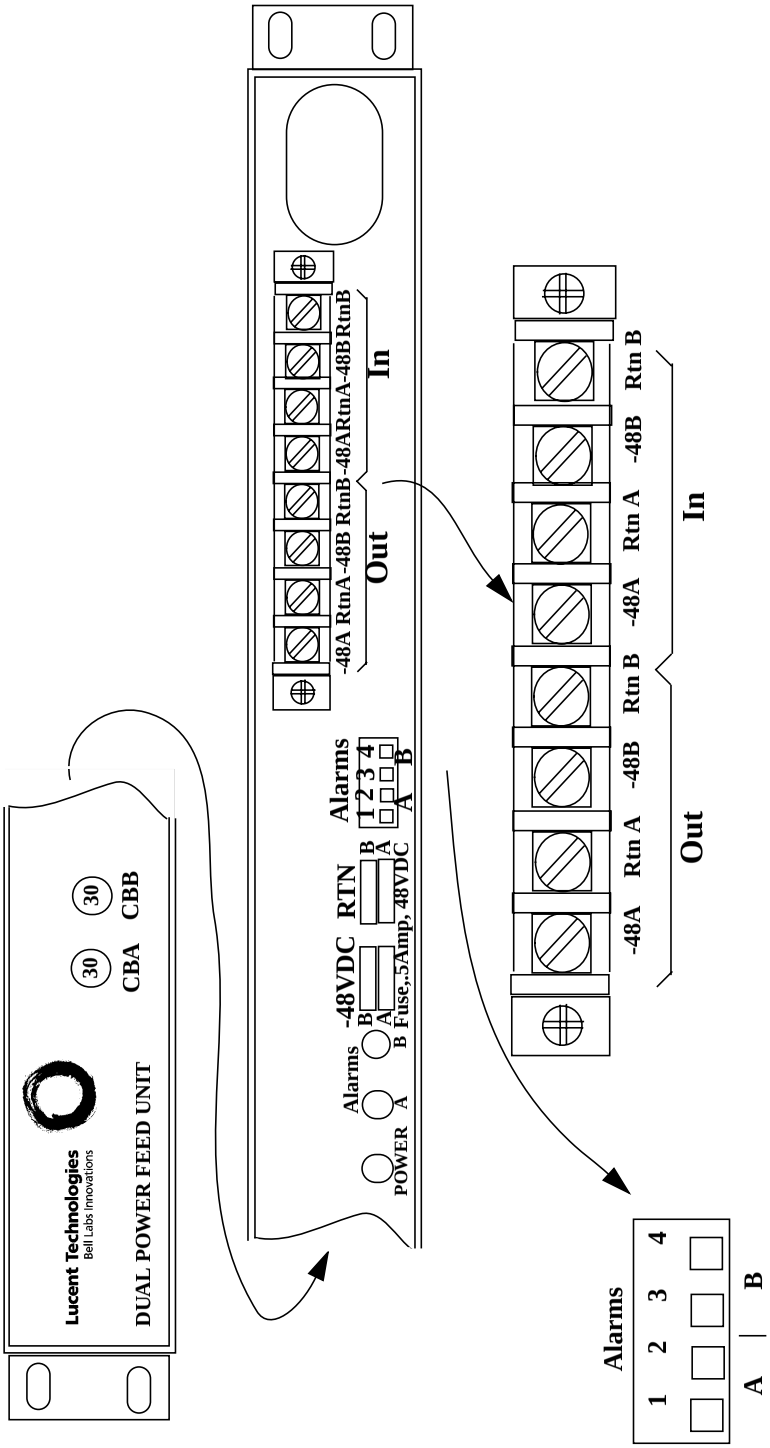


Figure 1. **Front Panel of DPFU**

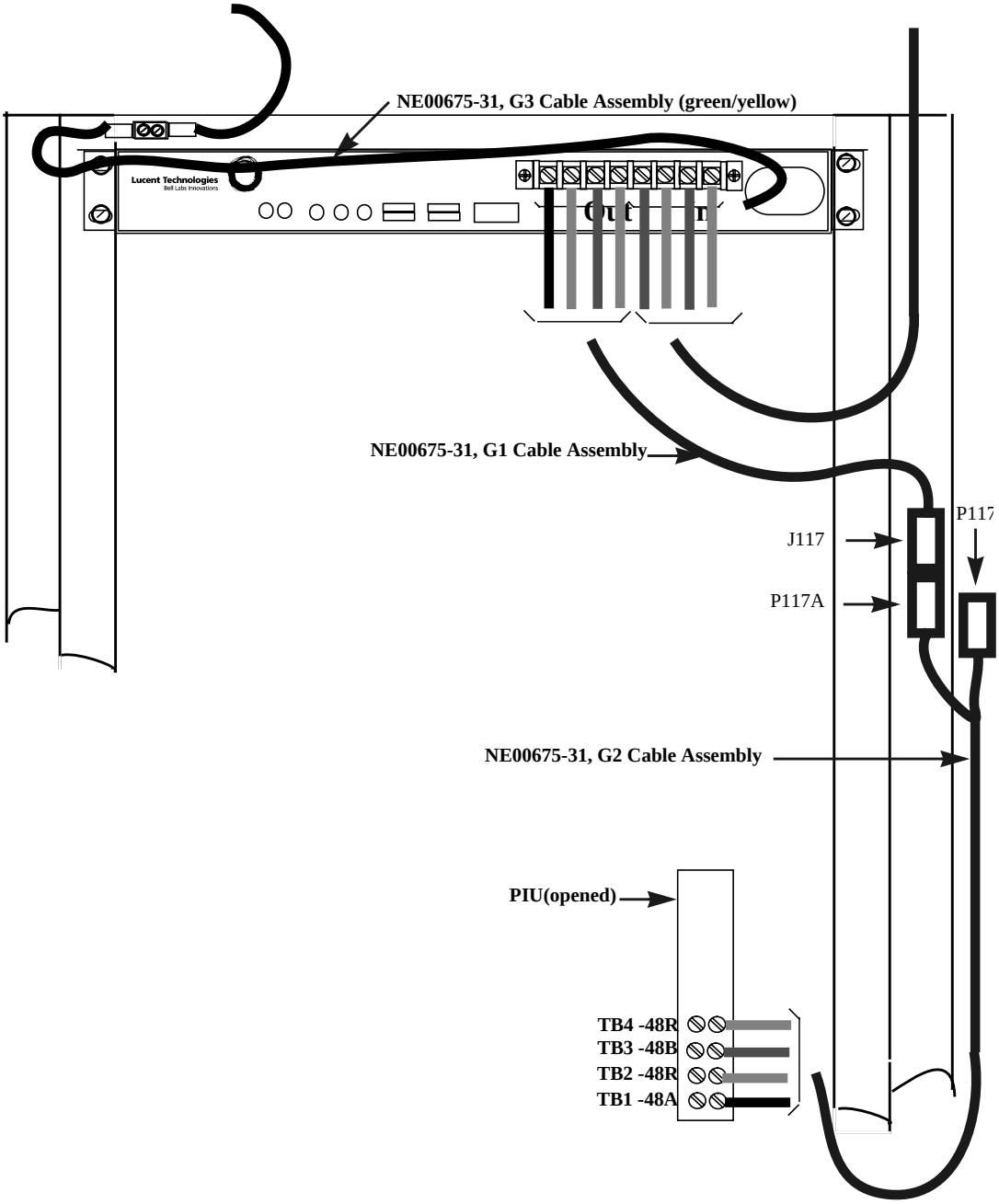


Figure 2. **RT Mounting and Cable Paths**

NE00676-70 Local Alarm Relay Unit Installation Procedure

2

General

Scope

This appendix to the *Customer Assembly Manual for RT Frames* provides the procedures to install the Lucent Technologies NE00676-70 Local Alarm Relay Unit for use with the *SLC*®-2000 Access System.

Overview

The SLC-2000® J1C265A-1 Remote Terminal (RT) Bay or J1C265B-1 (or C-1) Central Office Terminal (COT) Bay, (when configured as a RT) have no provision to provide local discrete alarm outputs to the customers alarm system. The Local Alarm Relay Unit (LARU), when used in conjunction with a 404B User Interface Panel (UIP), will now provide this capability for customers who require alarm indications independent of the imbedded DLC alarms (carried over the DS1 data link for TR-08 or the EOC channel for TR-303).

Reason for Reissue

Original issue.

Support

If any of the steps specified in this procedure cannot be completed as indicated, call the next level of support or the Lucent Technologies Regional Technical Assistance Center (RTAC) by the following phone number for assistance.

RTAC: 1-800-CAL RTAC (225-7822)

Training

No specific training is required.

Time Estimates

If LARU only is being installed:

a. Overall time to perform this procedure is estimated to be one half hour.

b. There will be no time out-of-service during this procedure.

c. One installer or craftsperson is recommended for this procedure.

If LARU and 404B UIP is being installed:

a. Overall time to perform this procedure is estimated to be one hour.

b. There will be no time out-of-service during this procedure.

c. Two installers or craftspersons are recommended for this procedure.

Risk Assessment

Procedural Risk Assessment

Rating (LARU only):

LOW Since the installation of the LARU does not impact transmission this procedure has a **LOW** procedural risk rating, since there is **NO** potential for a service interruption to the end customer, if any procedural deviations or procedure specific equipment failures occur during the procedure.

Rating (LARU and UIP):

MEDIUM Since the installation of the UIP may impact transmission this procedure has a **MEDIUM** procedural risk rating, since there is **a** potential for a service interruption to the end customer, if any procedural deviations or procedure specific equipment failures occur during the procedure.

Equipment

Equipment List

The following equipment, apparatus, and tools are required to perform this Modification Implementation Procedure.

Code	Qty	Note	Description
6018691341	1		Local Alarm Relay Unit Kit
NE00676-70, G1	1	R	Local Alarm Relay Unit
848137972	1	R	Mounting Plate e/ w 6-32 nuts and lockwashers (3 each)
NE00676-30 G1	1	R	Cable Assembly, Power
NE00676-30 G2	1	R	Cable Assembly, Alarm
	1	R	AMP Header (P253/J253)
	1	R	MIP 363-208-500 (Instructions)
	1	I	Volt-Ohmmeter

NOTES:

I = This item may be ordered from Lucent Technologies-IMDARC by the installer.

R = This item is required for installation of and is packaged with the DPFU.

Reference Documents

Reference Document List

Document Number	Description
NE00676-70	Local Alarm Relay Unit (specification)
NS00676-01	Local Alarm Relay Unit (schematic)

Engineering Information

Engineering Notes

- The LARU pwb is internally fused at 1/2 amp to protect the on-board DC/DC Converter. The converter is also diode protected to guard against improper polarity application of power.
- The green power LED will light whenever correct polarity -48VDC is present at power plug P305. Also the NP (No Power) relay is a normally powered relay and is operated whenever input power is present.
- P253 is a 9 pin D-sub plug (male) which receives its alarm information from the SLC-2000 UIP as follows:

TERM. #	NAME
1	CRITICAL (CR)
2	MAJOR (MJ)
3	MINOR (MN)
4	POWER MINOR (PMN)
5	GROUND RETURN

- The conditions at P253 will either be +5VDC or +3VDC. Any voltage below 4.7VDC appearing at P253 will be interpreted by the LARU as an alarm. All voltages are referenced to “CP RTN” on term 5.

Installation Procedure

Description

This procedure involves the adding of a LARU to operate with a SLC-2000 Remote Terminal Bay (RT) or a SLC-2000 Central Office Terminal Bay (COT) configured as a RT.

Physical Installation

❑ *Step 1:* The LARU comes equipped with an adhesive backed bracket equipped with three threaded studs. If installing the LARU on a J1C265A-1 Remote Terminal the LARU bracket should be mounted on the right forward corner of the fan unit, located directly over the User Interface Panel (UIP). with the long dimension, with two studs, parallel to the front of the unit. If you are mounting the LARU on a J1C265B-1 or C-1 COT the bracket should be mounted, in a similar manner, to the heat baffle above the UIP. See Figures 1 and 2.

❑ *Step 2:* Locate LARU and position it on the bracket studs. Using 6-32 nuts provided, lock down the unit. Note that connectors and LED face the rear of the bay.

Power Wiring

❑ *Step 3:* Locate the ED00676-30 G1 Power Cable. Engage the connector J305 (on this cable) to P305 on the LARU. See Figure 3.

❑ *Step 4:* In the right vertical duct of the bay (RT or COT), as viewed from the front, locate a J114 connector which will be unconnected on a COT and connected to P114 from the fan unit on a RT. For the COT connect P114 on the LARU cable to J114 located above. J114 on the LARU cable will not be used in this case. For the RT disconnect P114 (from the fan) from J114 in the duct. Connect J114 and P114 on the LARU cable between these two (i.e.-J114 LARU to P114 fan and P114 LARU to J114 duct.

❑ *Step 5:* Verify that green LED on LARU lights.

Alarm Wiring

❑ *Step 6:* Locate the ED00676-30 G2 Alarm Cable. Engage the connector J253(on this cable) to P253 on the LARU.

❑ *Step 7:* Dress the P253 connector end of the cable over the rear of the fan unit or heat baffle so that it is positioned near the rear of the UIP.

❑ *Step 8:* Verify that the UIP is a 404B. A label, visible from the front of the bay, located on the top surface of the unit, above the alpha-numeric display, will identify the unit. If the unit is a 404A continue with the next step. If a 404B go to step 23.

Craft Interface Unit Replacement

❑ *Step 9:* Since this procedure has the potential to drop in- service calls the customer may wish to schedule this work for a maintenance period.

❑ *Step 10:* Note all alarms and faults on the UIP display. Press the **Escape** button to gain access to the Main Display Menu and press the **Scroll** buttons to find the Alarms and Faults Menu.

❑ *Step 11:* Remove the ESD strap from the jack on the UIP. Relocate it to another convenient ground and wear the wrist strap from this point on.

❑ *Step 12:* The plastic housing of the 404A UIP you are about to remove is held in place by three integral plastic clips (either end plus top) and a plastic button on the bottom. The clips and button engage the metal housing that is part of the ARM shelf.

❑ *Step 13:* Disengage all clips, using an insulated spud or similar tool, and pull UIP forward and down until free of chassis (but with cables still connected).

❑ *Step 14:* Carefully pull out the lug end of the previously disconnected ground lead.

❑ *Step 15:* At this point the UIP is still operating and is connected to the system by three cables plugged into the UIP. The connectors associated with these cables are designated J254 (left side as viewed from the front, looking down on the top of the unit), J256 (right side upper connector) and J214 (right side lower connector).

❑ *Step 16:* At this point, if the connectors are removed and reconnected to the replacing 404B, and the process takes more than 55 seconds, the system will perform an internal audit and drop service (existing and new) for a period of approximately three minutes. To negate this from happening the following instructions should be rigidly followed.

❑ *Step 17:* Locate the 404B UIP and have another installer, also wearing an ESD strap, hold the 404B directly alongside the 404A, in order that the three referenced connectors may be quickly disconnected from the 404A and immediately connected to the 404B. The J256 and J214 connectors require the same orientation and thusly only go in one way. The J254 connector (power) is a 3-pin connector and is not keyed. The pins are carrying -48VDC, ground and -48VDC respectively so that it is imperative that the connector be properly aligned prior to engagement, since being off one pin will connect -48VDC to ground.

❑ *Step 18:* Quickly and carefully disengage the connectors from the 404A and reconnect them to the 404B.

❑ *Step 19:* If you exceeded the time and service is dropped, no further action is required and the system will recover automatically within 3 minutes.

❑ *Step 20:* Tape the lug on the black ground lead (p/o the 404B) and pass it through the chassis on the right side. Untape lug and refasten to frame ground.

❑ *Step 21:* Locate the J253 connector, part of a cable coming out of the center rear of the 404B, and pass it through the center opening in the chassis, and dress it toward the rear of the unit.

❑ *Step 22:* Align the 404B with the chassis and carefully snap in place while making sure that the cables are dressed properly.

❑ *Step 23:* Locate P253 connector (p/o NE00676-30 G2 cable previously attached to the LARU) and connect it to J253 from the 404B. It may be necessary to temporarily remove the fan unit or baffle to accomplish this.

❑ *Step 24:* Recheck all faults and alarms as instructed in Step 10. There should be no new alarms.

External Alarm Connections

❑ *Step 25:* The external alarm connections are taken from P306 connector on the LARU with a 25 pin D-sub female connector (J306) and cable, both provided by the customer. It is recommended that 26 gauge twisted pair wire be used between J306 and the customer's alarm system or distributing frame.

❑ *Step 26:* The connections and functions are shown in the following table:

J306/P306 TERMINATIONS				
Function	**Pin**	**Pin**	**Function**	**Title**
OACRA	1	14	OACRAR	CRITICAL AUDIBLE
OACRV	2	15	OACRVR	CRITICAL VISUAL
OAMJA	3	16	OAMJAR	MAJOR AUDIBLE
OAMJV	4	17	OAMJVR	MAJOR VISUAL
OAMNA	5	18	OAMNAR	MINOR AUDIBLE
OAMNV	6	19	OAMNVR	MINOR VISUAL
OAMSA	7	20	OAMSAR	POWER MINOR AUDIBLE
OAMSV	8	21	OAMSVR	POWER MINOR VISUAL
OANPA	9	22	OANPAR	NO POWER AUDIBLE
OANPV	10	23	OANPVR	NO POWER VISUAL

❑ *Step 27:* Procedure complete.

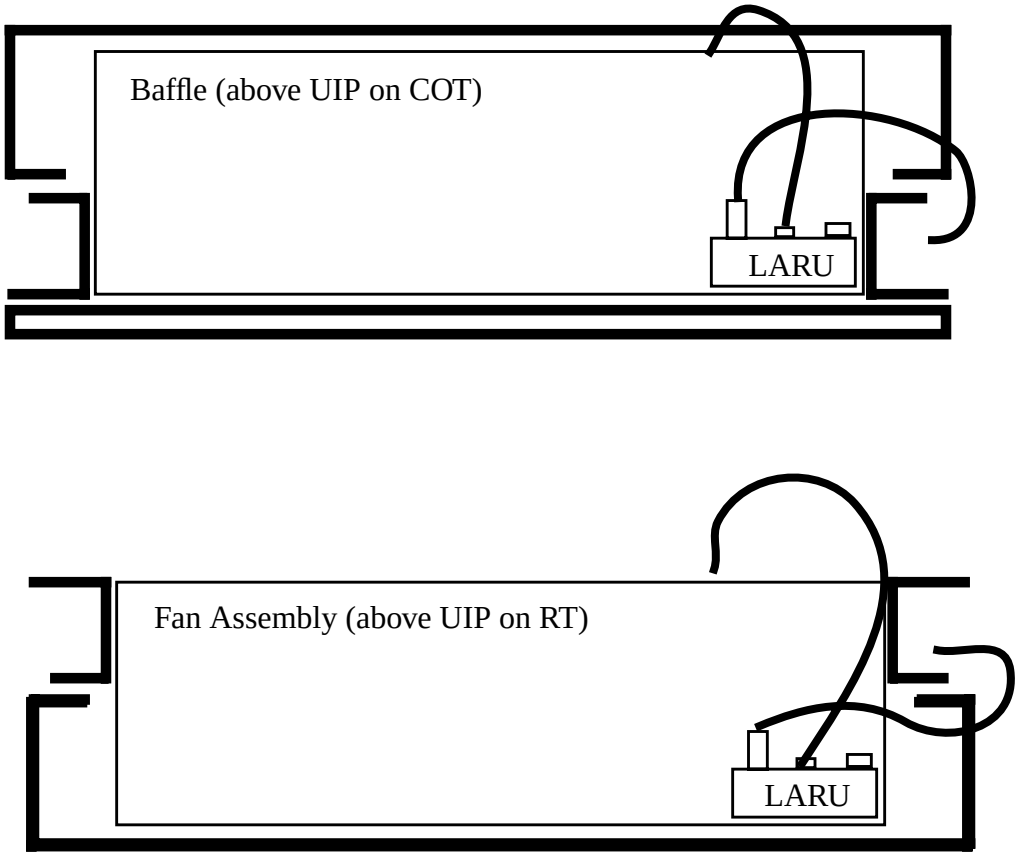
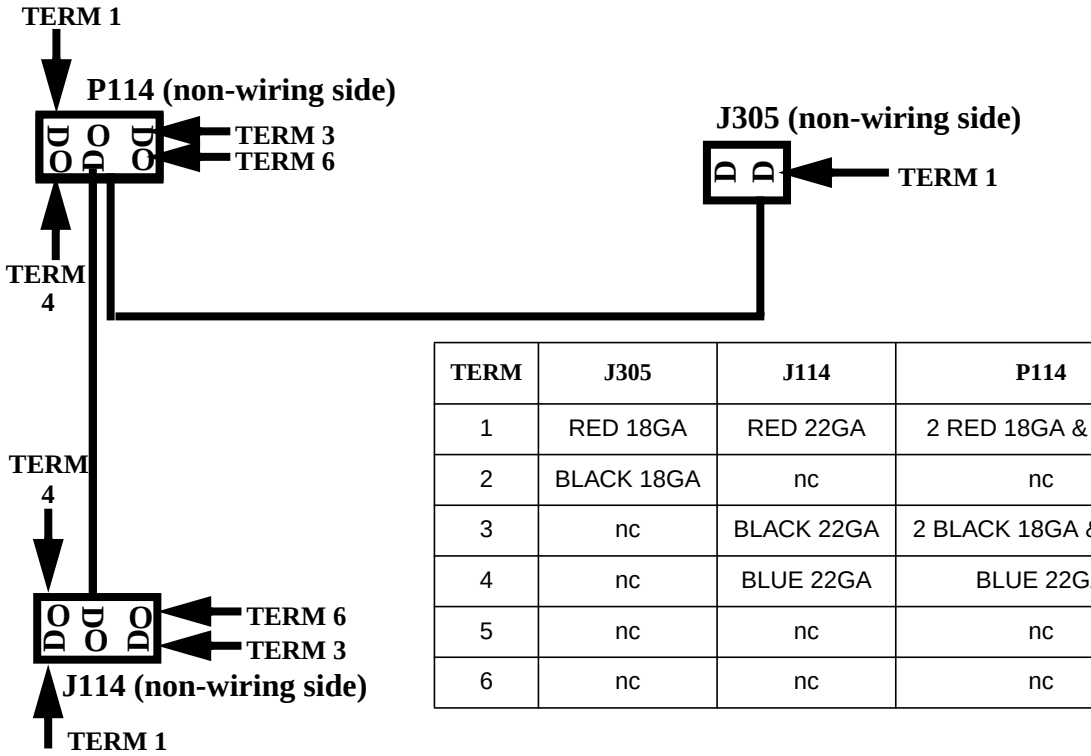
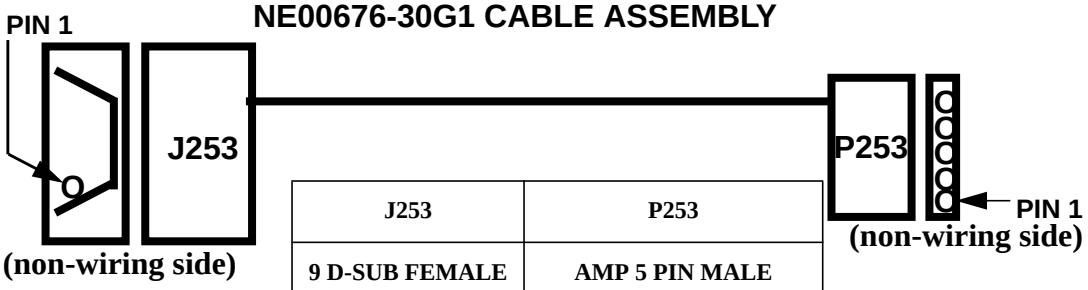


Figure 1. Mounting Positions for LARU on COT or RT



TERM	J305	J114	P114
1	RED 18GA	RED 22GA	2 RED 18GA & 22GA
2	BLACK 18GA	nc	nc
3	nc	BLACK 22GA	2 BLACK 18GA & 22GA
4	nc	BLUE 22GA	BLUE 22GA
5	nc	nc	nc
6	nc	nc	nc

NE00676-30G1 CABLE ASSEMBLY



J253		P253	
9 D-SUB FEMALE		AMP 5 PIN MALE	
TERM	FUNCT.	WIRE COLOR	TERM
1	CR	GREEN	1
2	MJ	WHITE	2
3	MN	ORANGE	3
4	PMN	YELLOW	4
5	GND	BLUE	5

NE00676-30G2 CABLE ASSEMBLY

Figure 2. LARU CABLE ASSEMBLIES

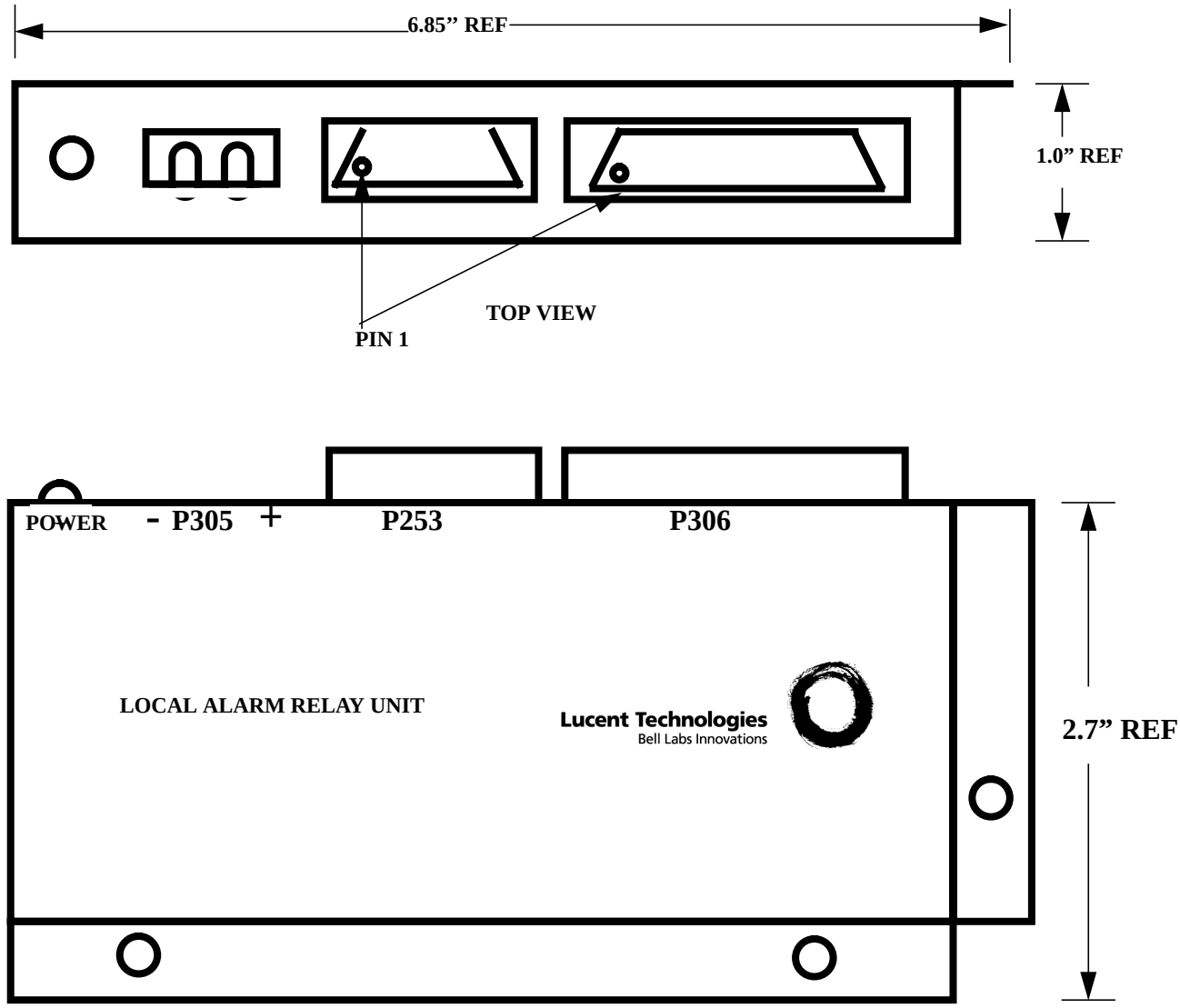


Figure 3. LARU External Views

Test Head Installation

3

Remote Test Head Mounting

General

This appendix to the *Customer Assembly Manual for RT Frames* provides the procedures to install the Lucent Technologies RTH-7000 or General Signal Networks Tau-tron *ngRTH** remote test head for use with the *SLC®*-2000 Access System.

NOTE:
These test heads are not compatible with the Line Test Fanout (LTF).

NOTE:
Refer to the Lucent Technologies RTH-7000 or the General Signal Networks Tau-tron *Installation and Maintenance Guide* for detailed installation and troubleshooting instructions for their test head panels.

Test Head Inspection

The test head is shipped with an assortment of associated apparatus.

Step 1: Unpack the test head from its shipping cartons.

Step 2: Verify that the mounting brackets, screws, ground cable, fuse, and *Installation and Maintenance Guide* are included.

Step 3: Verify that test head cables are available. The job specification will provide the list of required cables. See Table 1-1 for the listing of Tau-tron test head cables.

* ngRTH is a trademark of General Signal Corporation

NOTE:
The Tau-tron cables in Table 1-1 are required for the Lucent Technologies RTH-7000 or General Signal Networks Tau-tron *ngRTH* test head. The cable assemblies with part numbers with the prefix of 955- are obtained from Tau-tron.

Table 1-1. **Tau-tron *ngRTH* Test Head Cables**

Tau-tron Number	Qty	Note	Test Head Jack	Description
955-7000xxx037	1	1, 4	J12	Power Voltage
955-7000xxx038	1	1, 4	J15	Ringing Voltage
955-7000107	1		J13	MTAU Control (Digital)
955-7000xxx035		2, 4	J13	Optional MTAU Control (Digital)
955-700079	1		J14	Test Pairs (Analog)
955-7000xxx036		3, 4	J14	Optional Test Pairs (Analog)
955-7000003046		5	J14	Optional Test Pairs (Analog)
955-7000108	1			MTAU Control to *SLC*®-2000 ARM Shelf
955-7000xxx126	2	4, 6		VF Pairs (Analog)

Notes:

1. These cables are required to obtain the battery and ringing voltages from a miscellaneous fuse panel or battery and ringing voltage supplies.
2. This cable replaces 955-7000107 cable if a longer cable is required.
3. This cable replaces 955-7000079 cable if a longer cable is required.
4. The xxx in the Tau-tron part number indicates the cable length in feet (e.g., 010 = 10 feet).
5. The 955-7000003046 cable may be used between J14 of the *ngRTH* test head and the 955-700079 cable to provide front access.
6. The two 955-7000xxx126 cables are used to connect the 955-700079 or the 955-7000xxx036 cable to the miscellaneous distributing frame.

Step 4: Verify that there are circuit packs for the test head. Do not unpack the individual circuit packs until directed to do so. The job specification will provide the list of required circuit packs. See Table 1-2 for the listing of test head circuit packs.

NOTE:
Table 1-2 shows the usage of the test head circuit packs. POTS (plain old telephone service) testing assumes MLT (Mechanized Loop Testing) and special services testing assumes SARTS (Switched Access Remote Test System) or its equivalent.

Table 1-2. **Tau-tron *ngRTH* Test Head Circuit Pack Usage**

Card	Description	POTS Testing	Special Services Testing
MPM	Main Power Module	X	X
TCM	Test Controller Module	X	X
WDM	Wideband Digital Module		X
WTM	Wideband Transmission Module		X
ATM	Access and Termination Module		X
VTM	Voiceband Transmission Module	X	
VAM	Voiceband Amplifier Module	X	X
AMM	Analog Multimeter Module	X	X

Step 5: Attach the appropriate mounting brackets on the test head.

Test Head Dangler Connections

General

These procedures install the dangler cables on the Lucent Technologies RTH-7000 or General Signal Networks Tau-tron *ngRTH* remote test head. The dangler cables are connected to the test head before mounting the test head in a frame because there is limited access to the rear of the test head when it is mounted in a frame. Refer to the Figure 1-1 for the overall system interconnections.

Test Head Connections

General

The test head is powered (via J12) from -48v dc supplied by a battery supply provided by the customer. A separate ringing supply provides 20Hz ringing to the test head via the J15 connector.

The physical interface from the test head J13 connector to the *SLC*-2000 system is via the Access Resource Management (ARM) shelf's DS1 TIMING OUT/RT RMU LINK connector J44. This is a DB9 connector with a RS-232 interface.

The analog connections to the voice frequency pairs and to the test access path (TAP) are via J14.

Power and Ringing Cables

The following steps are performed when the 955-7000xxx037 and the 955-7000xxx038 cables are provided to obtain battery and ringing voltages from the miscellaneous power supplies.

These cables provide the -48V/-48VRTN and the +20Hz/-20Hz ringing connections to the miscellaneous power supplies. See Figure 1-1.

Step 1: Locate the test head's 955-7000xxx037 and 955-7000xxx038 dangler cables.

Step 2: Mate the P12 connector of the 955-7000xxx037 cable with J12 on the test head.

Step 3: Mate the P15 connector of the 955-7000xxx038 cable with J15 on the test head.

Control Link Cables

The following steps are performed when the 955-7000107 or the 955-7000xxx035 cable is provided to obtain control signals from the *SLC*-2000 Access System ARM shelf.

These cables are the control link with the test head. See Figure 1-1.

Step 1: Locate the test head's 955-7000107 or 955-7000xxx035 dangler cable (RS232/J13).

Step 2: Mate the P13 connector with J13 on the test head.

Communications Cable

This cable assembly, containing the test access pairs, is connected to the Miscellaneous Pairs Cross-connect block. See Figure 1-1.

Step 1: Locate the test head's 955-7000000046 dangler cable and the 955-70079 or 955-7000xxx036 cable.

Step 2: If the 955-7000003046 cable is used, go to Step 3. Otherwise go to Step 5.

Step 3: Mate the P14 connector of the 955-7000003046 cable with J14 on the test head.

Step 4: Mate the 955-70079 or 955-7000xxx036 cable's P14 connector with J14 on the 955-7000003046 cable. Go to next paragraph **Test Head Installation**.

Step 5: Mate the 955-70079 or 955-7000xxx036 cable's P14 connector with J14 on the test head.

Test Head Installation

The test head should be located in the same or nearby frame as the RT.

Step 1: Connect the ground wire to the lug on the rear of the test head.

Step 2: Install two alignment pins (C 402444491) to the frame where the test head is to be installed.

Step 3: Arrange the cables that were attached in the previous paragraphs so that they are accessible from the front of the test head.

NOTE:
Ensure that all cable danglers from the rear of the test head have been installed. The access to the rear of the test head is very limited once it has been installed in the frame.

Step 4: Mount the test head to the miscellaneous frame with the four screws that came with the unit.

Step 5: Connect the ground wire that was installed in Step 1 to the frame. Scrape the paint from around the hole on the frame that will be used for the ground strap.

Remote Test Head Interconnections

General

These procedures install the interconnect cables between the Lucent Technologies RTH-7000 or General Signal Networks Tau-tron *ngRTH* remote test head cables and the associated power supplies and between the test head cables and the *SLC*-2000 Access System Remote Terminal interfaces. Refer to the Figure 1-1 for the overall system interconnections.

Test Head Interconnections

General

The cables that were installed in previous steps will now be connected to the external equipment. The connection may be direct or employing other cables.

Power and Ringing Cables

The following steps are performed when the 955-7000xxx037 and the 955-7000xxx038 cables are provided to obtain battery and ringing voltages from the power supplies or a miscellaneous fuse panel.

These cables provide the -48V/-48VRTN and the +20Hz/-20Hz ringing connections to the miscellaneous power supplies. See Figure 1-1.

Step 1: Locate the 955-7000xxx037 and the 955-7000xxx038 cables from the test head and route them to the power equipment. Use tie-wraps to secure the cables.

Step 2: Connect the leads in accordance with the associated figures for the P12 connector of the 955-7000xxx037 cable (See Figure 1-2) at the battery supply or an assigned fuse position for the test head.

Step 3: Connect the leads in accordance with the associated figures for the P15 connector of the 955-7000xxx038 cable (See Figure 1-3) at the ringing supply or an assigned fuse position for the test head.

Step 4: If connected to a fuse panel, equip the test head battery fuse position with a 5 amp fuse.

Step 5: If connected to a fuse panel, equip the test head ringing fuse positions with a 1/2 amp fuse each for the positive and negative ringers.

Control Link Cables

These cables are the control link with the test head. See Figure 1-1 for the cabling and Figure 1-4 for the signals on J44 of the ARM shelf.

NOTE:
The lead designations for J44 of the *SLC*-2000 Access System ARM shelf and the test head are shown in Figure 1-4 to indicate that the connector is used for more than one purpose and that signals may appear on the connector that may not be required for a specific application.

Step 1: Locate the test head's 955-7000107 or 955-7000xxx035 dangler cable (RS232/MTAU) that was installed previously.

Step 2: Locate the test head's 955-7000010108 cable.

Step 3: Mate the 955-7000010108 cable's MTAU connector to the MTAU connector of the dangler cable, 955-7000107 or 955-7000xxx035, installed previously.

Step 4: Mate the 955-7000010108 cable's P44 connector to the J44 connector of the ARM shelf.

NOTE:
If the ARM shelf is mounted in a frame that is backed up against a wall, the access to J44 will be very difficult. It may be necessary to remove the mounting screws from the ARM shelf and slide it forward to gain access to J44. Reattach the ARM shelf to the frame after connecting the test head cable to J44.

Step 5: Connect the TL1 DB25 connector to the circuit for communications to special services test operations system, such as, SARTS, as determined by the customer.

Step 6: Connect the Alarms DB15 connector to the *SLC*-2000 miscellaneous alarms as determined by the customer.

Communications Cable

This cable assembly, containing the test access pairs, is connected to the Miscellaneous Pairs Cross-connect block. See Figure 1-1 for the cabling and Figure 1-6 for the signals on J14 of the test head.

Step 1: Locate the test head's 955-7000000046 dangler cable and the 955-70079 or 955-7000xxx036 cable that were installed previously.

Step 2: Mate the 955-70079 or 955-7000xxx036 cable's J301 connector with the P301 connector of the ED7C723-34, Group 1 TAP bay cable.

Step 3: Locate the test head's two 955-7000xxx126 cables.

Step 4: Mate the first 955-7000xxx126 cable to the MLT Control RJ11 connector of the 955-70079 or 955-7000xxx036 cable.

Step 5: Mate the second 955-7000xxx126 cable to the Monitor/Talk RJ11 connector of the 955-70079 or 955-7000xxx036 cable.

Step 6: Connect the first 955-7000xxx126 cable MLT Control RJ11 connector to the POTS VF circuit as determined by the customer.

Step 7: Connect the second 955-7000xxx126 cable Monitor/Talk RJ11 connector to the POTS VF circuit as determined by the customer.

Remote Test Head Turn-Up

General

These procedures install the circuit packs in the Lucent Technologies RTH-7000 or General Signal Networks Tau-tron *ngRTH* test head.

NOTE:
Refer to the Lucent Technologies RTH-7000 or the General Signal Networks Tau-tron related documents for detailed installation and troubleshooting instructions for their test head panels.

Circuit Pack Installation

Step 1: Unpack the test head circuit packs from their shipping carton(s).

Step 2: Install the Main Power Module (MPM) in the left-most slot of the test head.

Step 3: Install the fuse and fuse receptacle in the MPM. Push on the receptacle and turn clockwise approximately one-quarter turn.

Requirement: Yellow **ALARM** LED extinguishes.

Step 4: Install the remainder of the circuit packs, as required, in the order shown below and wait for the **FAULT** LED to extinguish before inserting the next pack. The slots progress from left to right in the shelf.

Test Controller Module (TCM)
Wideband Digital Module (WDM) *
Wideband Transmission Module (WTM) *
Access and Termination Module (ATM) *
Voiceband Transmission Module (VTM) *
Voiceband Amplifier Module (VAM)
Analog Multimeter Module (AMM)
* If listed on the job specification.

NOTE:
Refer to customer provided information to determine which circuit packs are to be installed in the test head. See the note and Table 1-2 on Page 3 for more information.

Requirement: The LED on the inserted circuit pack illuminates. Red **FAULT** LED on MPM extinguishes in approximately 10 seconds after the insertion of each circuit pack.

Step 5: Repeat Step 4 until all of the provided circuit packs are installed.

Step 6: Verify that the **FAULT** and **ALARM** LEDs on the MPM are extinguished.

SLC-2000 Access System Circuit Packs

General

These procedures verify that the software and the circuit packs in the *SLC*-2000 Access System shelves that are required for the operation of the Lucent Technologies RTH-7000 or General Signal Networks Tau-tron *ngRTH* test head are present. See Table 1-3 for the circuit packs that must be present in the *SLC*-2000 Access System for the operation of the test head.

Table 1-3. ***SLC*-2000 Access System Circuit Packs**

Pack	Location	Description
SMU	ARM Shelf	System Memory Unit
LAN	ARM Shelf	Link to Alarms and Networks
PDC	ARM Shelf	Provisioning and Display Controller
MDC	MDS	Metallic Distribution Controller
T8U *	MDS	TR-08 Unit
PTU	MDS	Power and Test Unit

* The T8U is required for TR-08 operation only.

Circuit Pack Verification

Step 1: Verify that the SMU, LAN, and PDC are in the ARM shelf.

Step 2: Verify that the MDC, T8U, and PTU are in the MDS shelf(ves) of the subscriber circuits or drops to be tested.

NOTE:
The T8U is required for TR-08 operation only.

Step 3: Verify that the DLC software is as follows:

RT: R 3.02.01 or R 4.05.00 (or later)

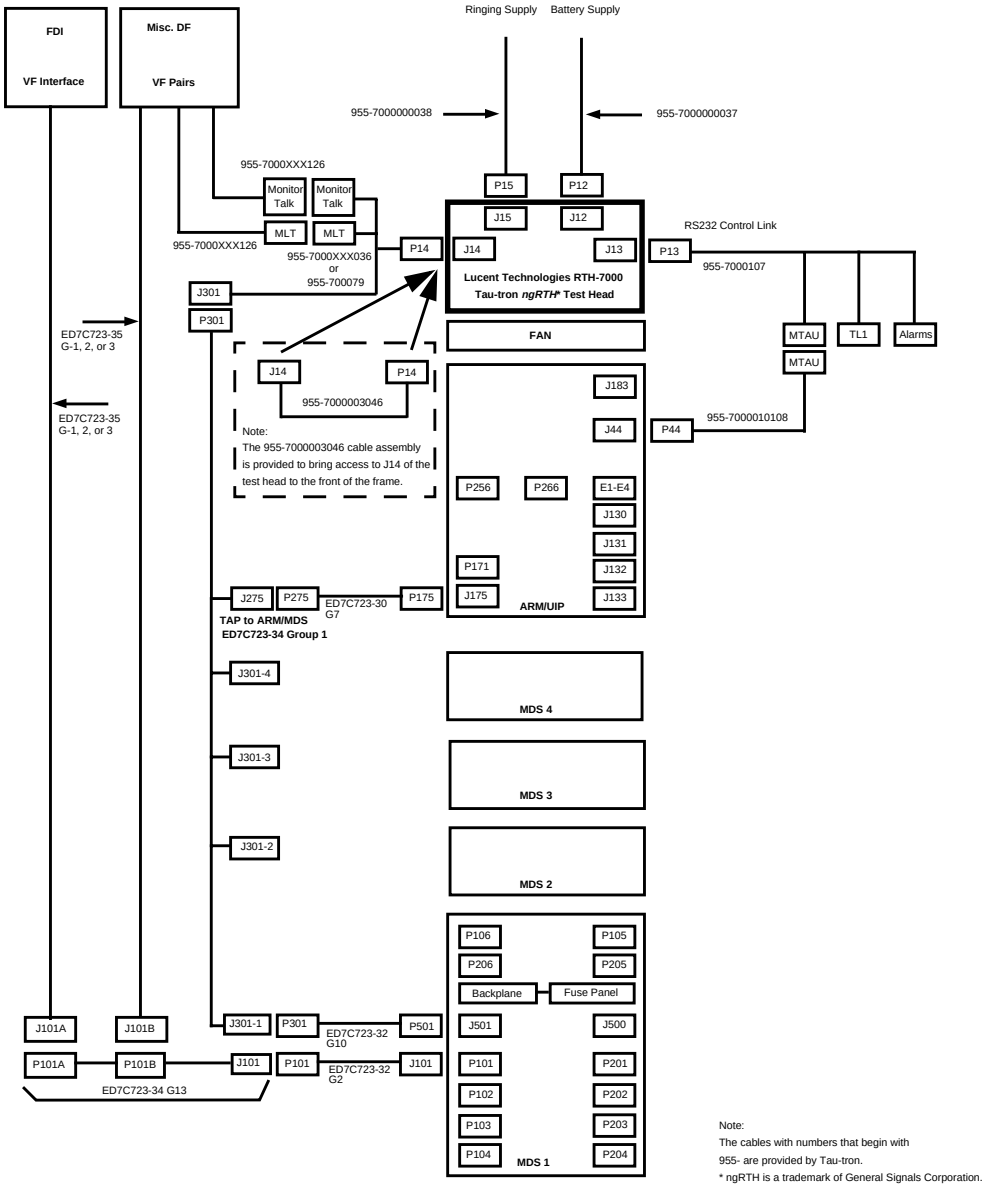


Figure 1-1. **Test Head System Interconnections**

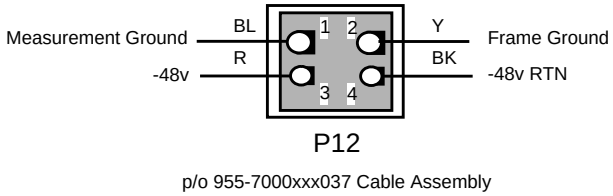


Figure 1-2. **Test Head Power Wiring P12**

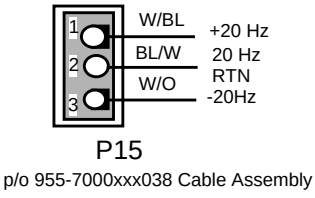


Figure 1-3. **Test Head Ringing Wiring P15**

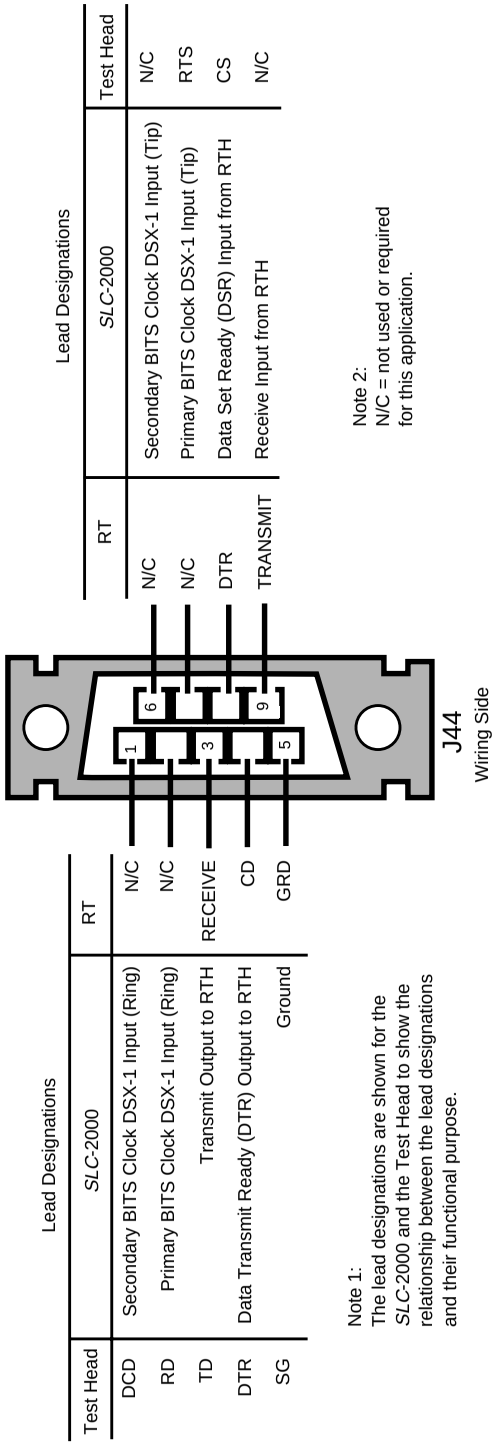


Figure 1-4. **ARM Shelf DS1 Out/RT RMU Link J44**

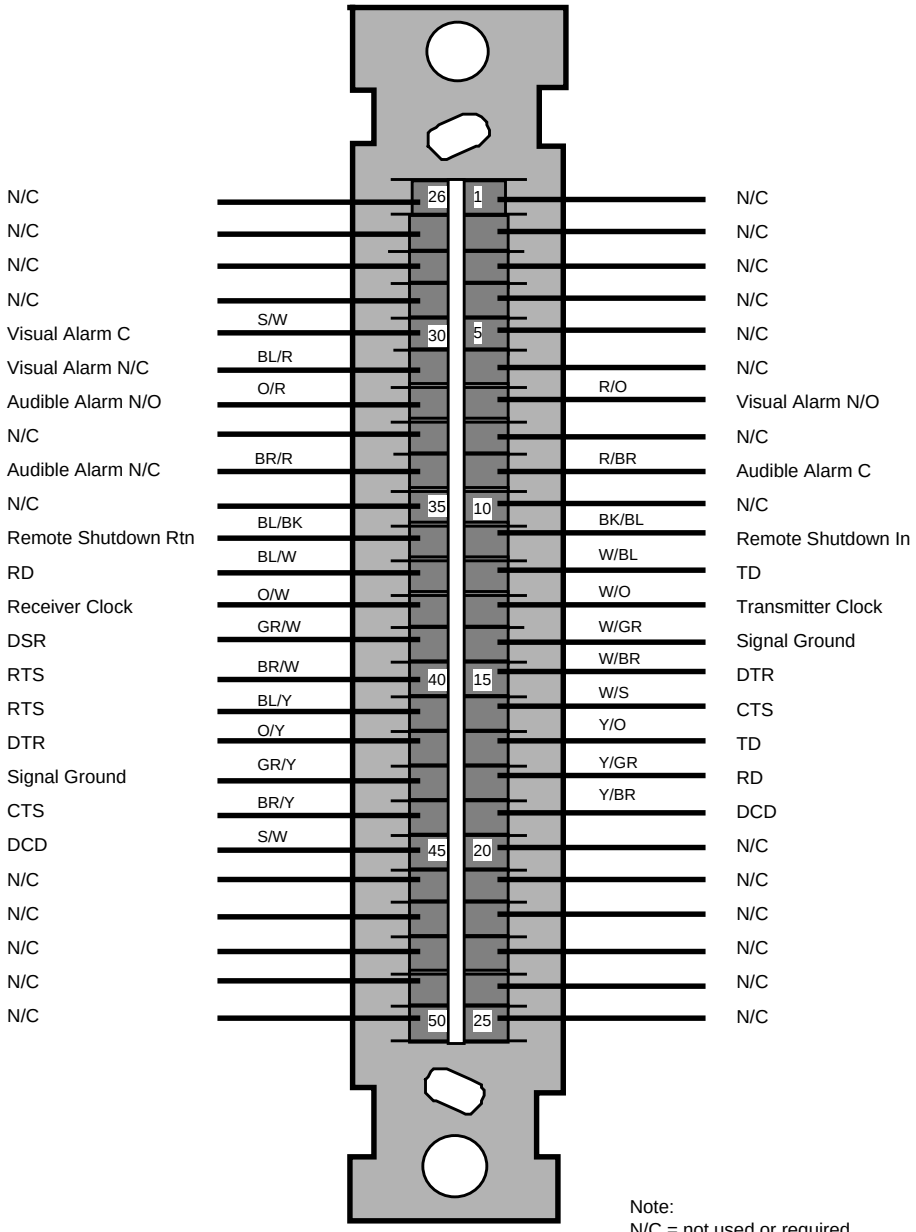


Figure 1-5. **Test Head Digital Wiring P13**

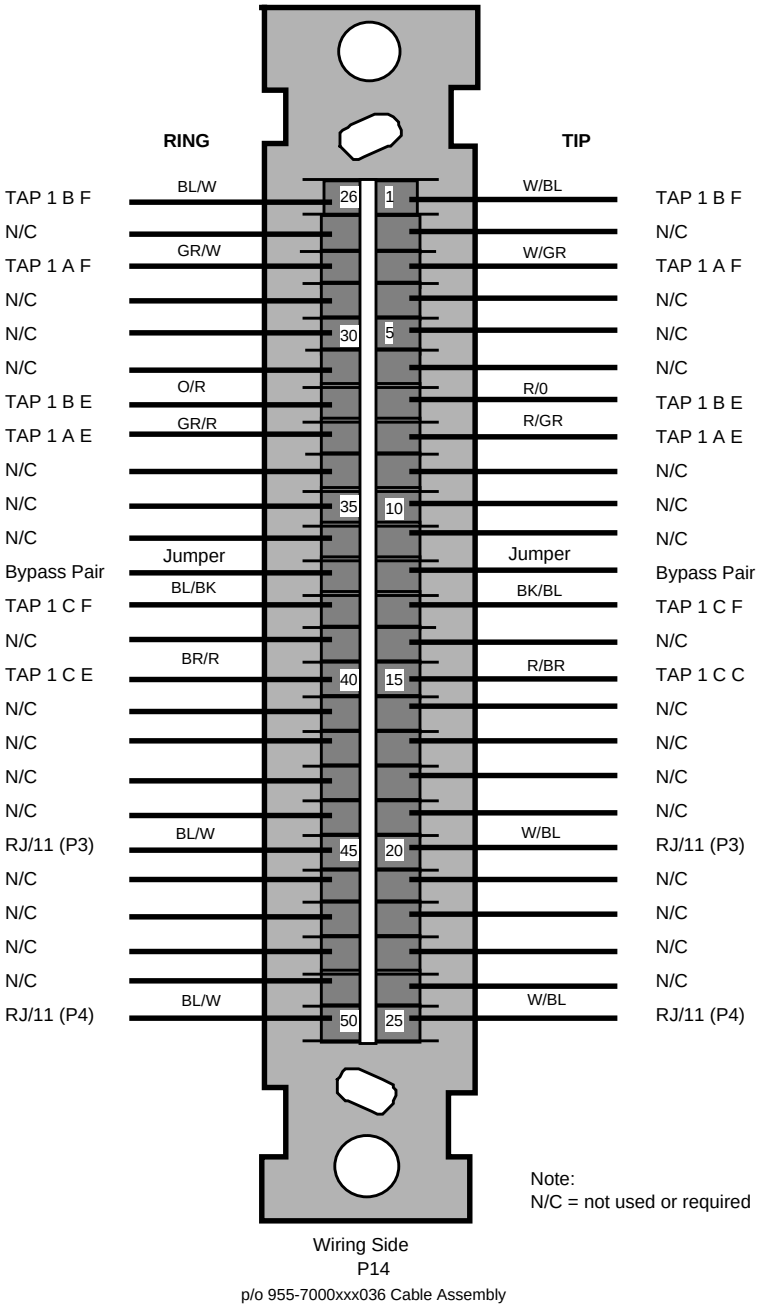


Figure 1-6. **Test Head Analog Wiring P14**